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EXCAVATING ENGINEER

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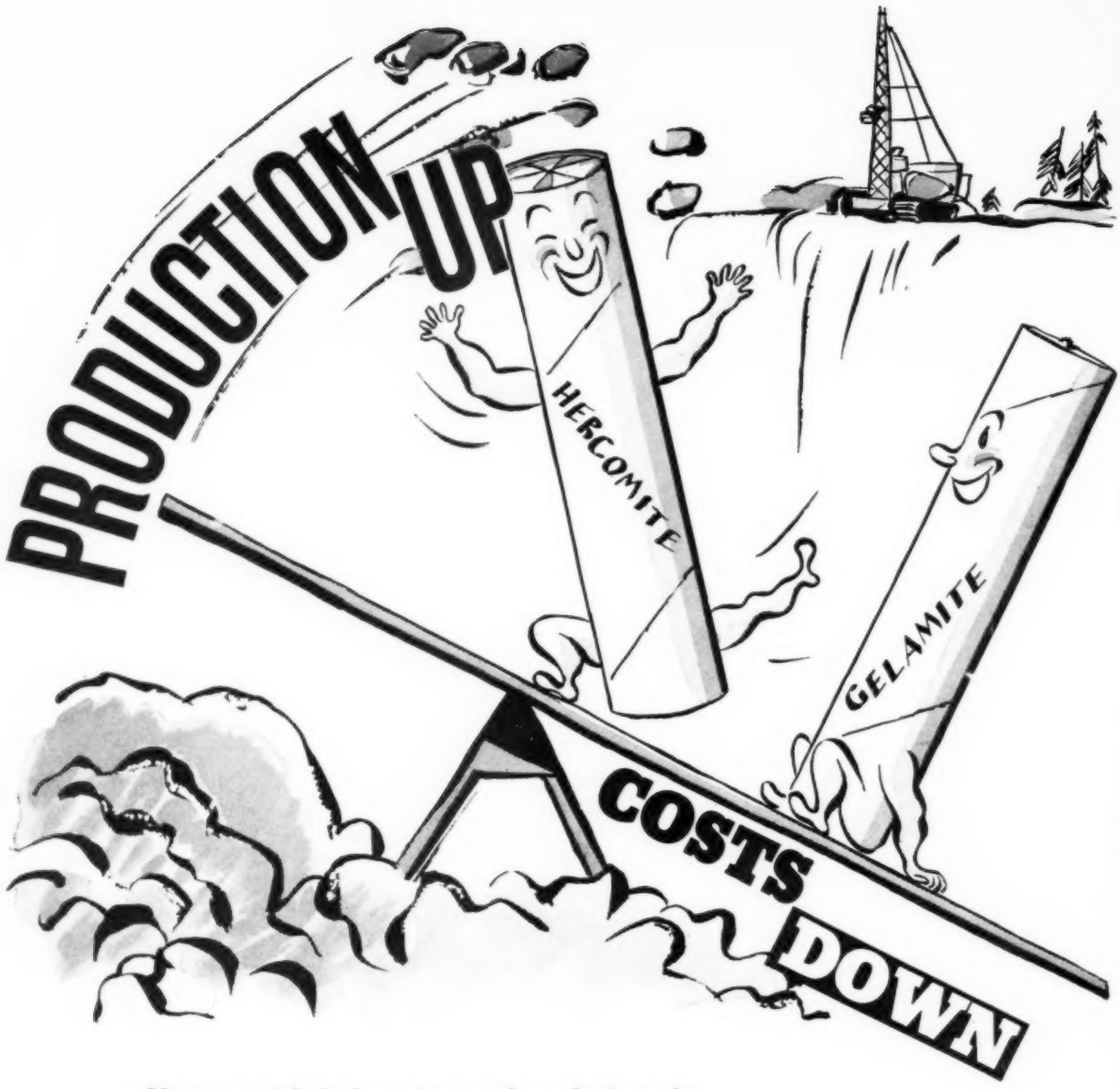
Highway excavation near Penn Yan, New York. A Mohawk Paving Co. job.



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Gila River Siphon

The first of three monolithic concrete siphons on the Gila River Project in Arizona nears completion.

Colorado River Aqueduct

A review.

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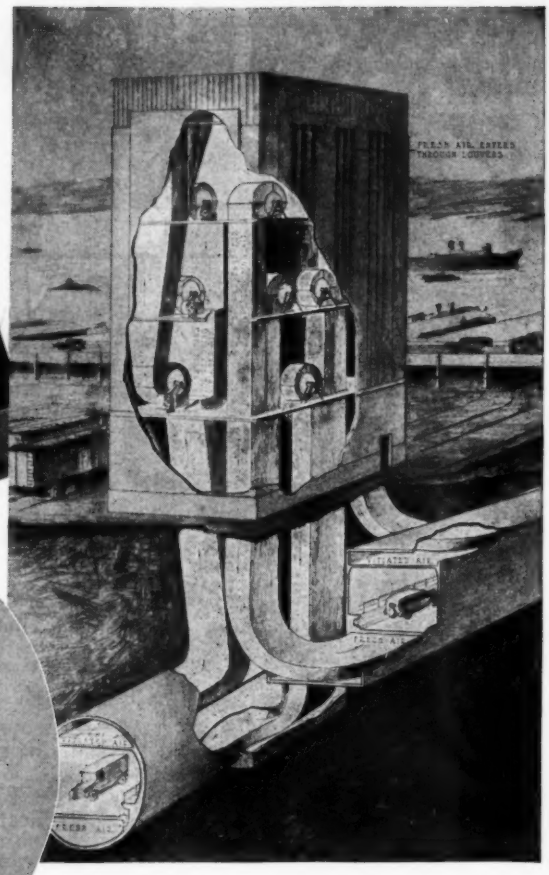
"I like the Lincoln Tunnel. The air's always so fresh!"



A Buffalo Forge Company 272,000-cfm blower fan coupled to two G-E two-speed induction motors. The main motor develops 251 hp for turning the fan at 450 rpm or 74.4 hp at 300 rpm. For slower speeds the gear-motor at the left turns the fan at 230 rpm with 31.5 hp or at 115 rpm with only 4 hp

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SALT

Jefferson Island Salt Mining Company mines high grade salt in unusual operations on the same island that Jean Lafitte, infamous south coast pirate, is rumored to have buried his ill-gotten wealth.

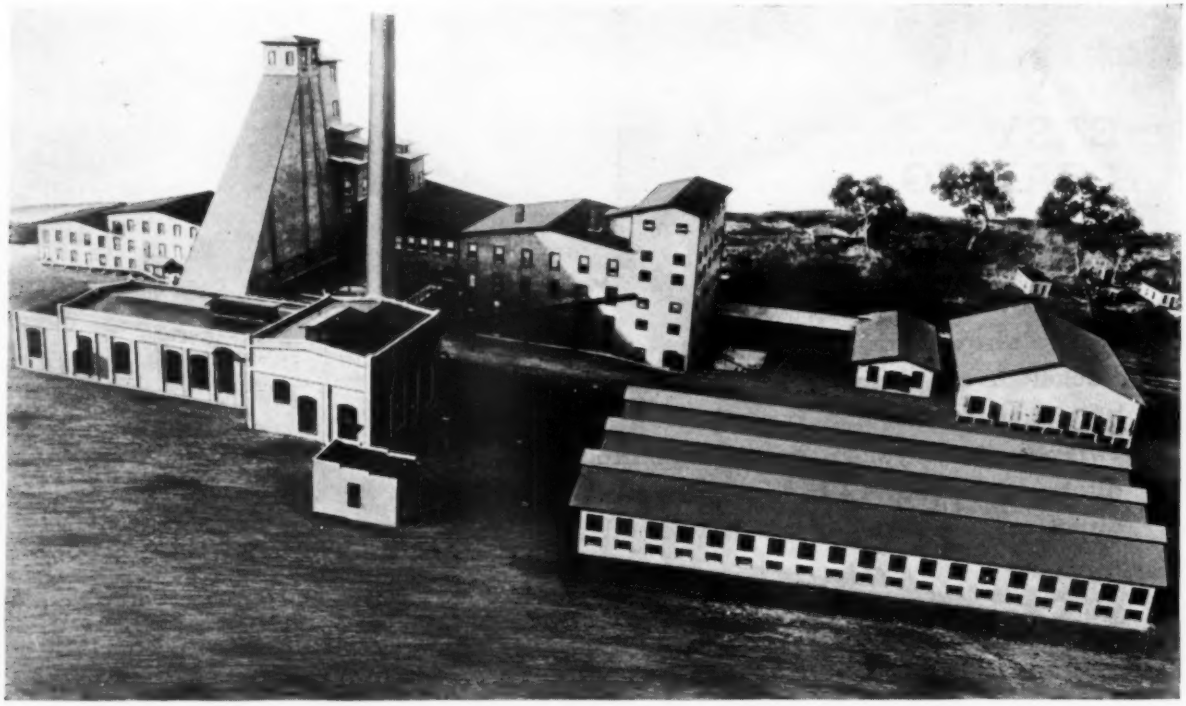
Prepared in Collaboration with
J. C. GORDY,
Vice-President.

THOUSANDS of years ago, in prehistoric times, it is thought that a neck of the sea extended into what is now the state of Louisiana. Later, this was cut off from the main body of water, forming an isolated lake comparable to the Great Salt Lake of Utah. Eventually the water all evaporated, leaving a layer of salt and other sea minerals which, as time passed, was covered by successive layers of alluvial soil until it was nearly five miles below the surface.

In those far-gone ages the earth's surface was gradually assuming its present general shape. During the forming process a huge crack developed over the Louisiana salt bed and the salt turned viscous by the tremendous pressure of the overburden, was forced into the crack, forming five great salt domes under the earth's present surface. The Jefferson Island Salt Mining Company now operates over the most northern of these domes.

Through the centuries this abundance of salt lay untouched and unknown as history unfolded above it in the beautiful scenic spot later to be known as Jefferson Island, in the Attakapas country, renowned in literature as the home of Longfellow's Evangeline.

• A view of the Jefferson Island Salt Mining Company plant with Lake Peigneur in the background. On the extreme right of the large building are the vacuum pans which make the Evaporated Salt and the high quality Table Salt which is packed in the Hexagon Carton.



• All bags, barrels, blocks and cases are loaded into the freight cars from this covered platform on the north side of the 1,200-foot plant.

In 1874 Governor Miro, acting for the Spanish crown, made a grant of the land to Messrs. Prevost and Carlin. The land, then known as Cote Carlin, was later sold to a brother-in-law of the Pirate Jean Lafitte, who terrorized the entire gulf coastal population from Florida to Mexico, and it has been rumored that Lafitte's plunder is buried there. Many treasure hunting expeditions searched the island for gold but completely overlooked the vast treasure of salt.

In the late '70's Joseph Jefferson, the well known artist and actor who made "Rip Van Winkle" famous, bought the island and it was then that it was given its present name of Jefferson Island.

Because of the liking animals have for salt, wild life was abundant, and the Indians found the region a fine hunting ground. It was hunting too, that caused J. Lyle Bayless and Lawrence Jones to buy the island in 1917. Their original idea was to keep it as a hunting preserve but they later operated a rice and sugar plantation there and still later added the raising of Black Angus and Brahma cattle to their activities.

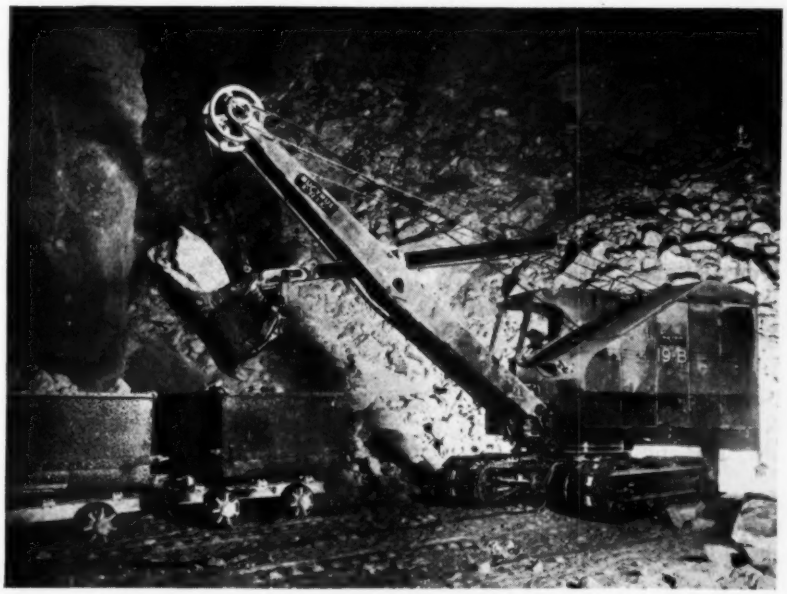
First Prospecting Done in 1918

In 1918 the first prospecting was done to determine the commercial possibilities of the salt which had been discovered at an earlier date while drilling a water well. In 1921, after numerous test wells had been drilled to outline the area of the salt dome definitely, a shaft was completed in this, the most northern of the series of five domes under Louisiana's famous "Five Islands." This dome, according to geologists, was precipitated last (after other minerals had settled or crystallized) and it is for this reason that the Jefferson Island Salt Mine produces pure sodium chloride.

The first shaft to be sunk was made of timber and after getting within ten feet of the salt deposit, it was wrecked completely by quicksand. In the second attempt, a circular concrete shaft thirty feet in diameter was constructed and sunk in the manner of a caisson project. Salt was reached after the shaft had been sunk 100 feet, but an additional concrete lining was extended 60 feet into the salt, making 160 feet in all. Beyond this point the shaft is 18 feet square and is dug through solid salt to a depth of 900 feet.

The shaft is divided into four sections. Two compartments are used for hoisting and lowering the salt skips, one for passenger and supply service and the fourth entirely for ventilation. Air is forced into the mine by a Jeffrey

• The high roof development is confined at present to the 800-foot level where salt is made available in large piles. A Bucyrus-Erie Electric Shovel equipped with a ⅝-yard dipper loads the loose salt into cars for transportation to the crusher.



Aerovane fan installed on the surface.

Use Electric Power

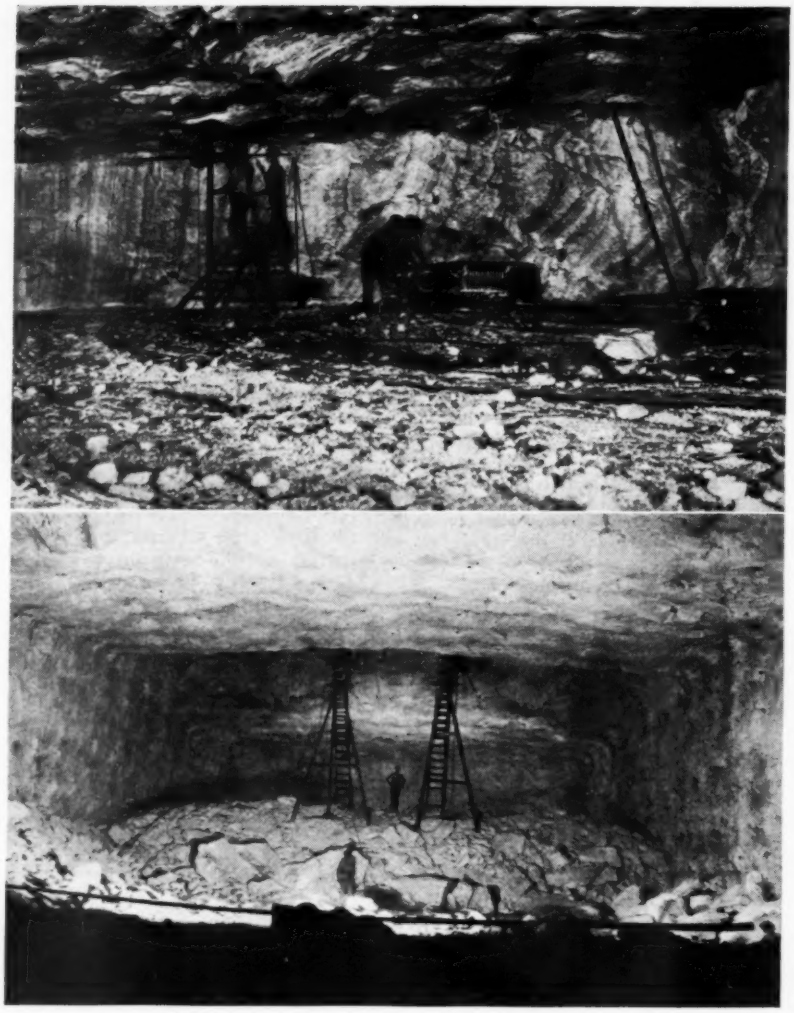
Electric power for mining and milling operations is generated on the surface with non-condensing turbines, and a power line sheathed in a lead-covered cable extends from the power plant to a substation in the mine at the 800 foot level. Power taken into the mine is 440 volt 3 phase 60 cycle alternating, and is converted with a motor-generator set to direct current for operation of trolley locomotives, and electric drills. All other equipment, including two shovels, the crusher and the automatic hoist are operated on alternating current.

Two levels are being operated by the Jefferson Island Salt Mining Company at the present time. The room and pillar method of mining is used exclusively in the development of the first level which is 800 feet below the surface. No timbering of any sort is necessary and the rooms with their high straight walls and pillars give the impression of great vaulted domes. Completed rooms have an average width of 80 feet and the height of the roof varies from 85 to 100 feet.

In driving an entry into a solid face of pure rock salt, a Goodman undercutter with a 7½-foot cutter bar is used at the floor level, removing a horizontal kerf six inches thick across the full width of the room.

All Drilling Horizontal

Drilling of the face to a height of 14 feet is accomplished with Scranton Electric drills equipped with two-inch hollow feed bar attachments, and mounted on drill columns. Special drill bits are used and holes seven feet long can be drilled in from two to three minutes. As the salt is not abrasive, drill bits last about 60 days. By the same token, shovel teeth need little sharpening or replacing. Drilling is all horizontal, and drill holes in the 14 foot cut are 1½ inches in diameter and 7½ feet deep. Approximately 80 holes are drilled in a face 80 feet wide and 14 feet high and are loaded with a special grade of dynamite. Blasting is accomplished with fuse and caps, and approximately 460 tons of salt are blasted from each area.



• Top: After undercutting is completed, holes for dynamiting are drilled with Scranton Electric Drills equipped with special drill bits. Seven-foot holes can be drilled in two or three minutes. Bottom: After the undercut salt has been removed, scaffolding like that shown here is put up and holes are drilled in the roof so the roof salt can be shot down.

Low Entries Cause Loading Problem

The undercut development in progress at this time is confined to the second level at a depth of 980 feet. The second level was reached through construction of a sloping shaft at a 30 degree angle for a lineal distance of 375 feet. Mining of a second level in a coastal dome is without precedent and careful calculations were made prior to its construction.

Loading salt from the 14-foot entries on the second level presented an unusual problem and after careful study of the situation a short-coupled mucker was purchased from Bucyrus-Erie. This unit is a modified electric positive-crowd shovel with a special 10-foot boom, 7-foot 9-inch dipper handle and ⅝-yard dipper. The shovel is equipped with a 30 H.P. electric motor operating on a 440 volt alternating current. It is working on an 8-hour shift, and is at present handling approximately 500 tons per shift. The tonnage being handled is governed by the nature of the development on the second level.

After removal of the undercut salt and after there has been sufficient lineal progress into an entry, shooting of the roof begins. Fourteen-foot drills, mounted on columns, are used and after drill-

John Hampden Lewis

John Hampden Lewis, civil engineer and widely known expert in levee construction and flood control work, died January 6, of a heart attack at the age of 54.

The son of the late Colonel Sidney F. Lewis, who was at one time chief engineer of the Southeast Arkansas river control development and later chief engineer of Orleans levee board, Mr. Lewis was born in New Orleans and had lived there all his life. Upon his graduation from the Tulane university college of engineering in 1905, Mr. Lewis was associated for several years with the United States Army Engineer Corps and served as junior engineer in levee construction.

In 1916, Mr. Lewis served with the Washington Artillery on the Mexican border and, during the World War, he was captain in the 312th Engineer Corps, stationed in France. Following his army service, he entered the contracting field and was employed in extensive levee and drainage work throughout the South and Southwest.

During the Mississippi flood of 1927, Mr. Lewis was engaged in intensive engineering and flood control projects on the upper river. He was known along the river, his associates said, as an excellent high water "fighter."

Mr. Lewis was president of the Lewis-Chambers Construction Company, Inc., which was formed in 1928 and, since that date, had been occupied with his partner, John T. Chambers, in numerous large-scale engineering projects. Among the undertakings in which Mr. Lewis had recently participated were the construction of the All-American Canal in the Southwest, and the Florida ship canal. Mr. Lewis had also been engaged in the construction and laying of levee mats, his firm having developed new methods of procedure in this work.

A former vice-president of the Mississippi Valley Flood Control Branch of the Associated General Contractors of America, Mr. Lewis, at the time of his death, was a member of the organization's board of directors.

Mr. Lewis is survived by six sisters and a brother.

---

ing a whole round extending horizontally across the width of the room, all holes are loaded with the special grade dynamite and detonated with a fuse and No. 6 blasting caps. As the blasted salt builds up on the floor, progressive 10-foot roof benches of salt are blasted until the room is entirely filled with loose salt to a height of approximately 90 feet. It is then that loading begins, and is carried on in regular quarry fashion.

Use 5/8-Yard Shovel on 800-Foot Level

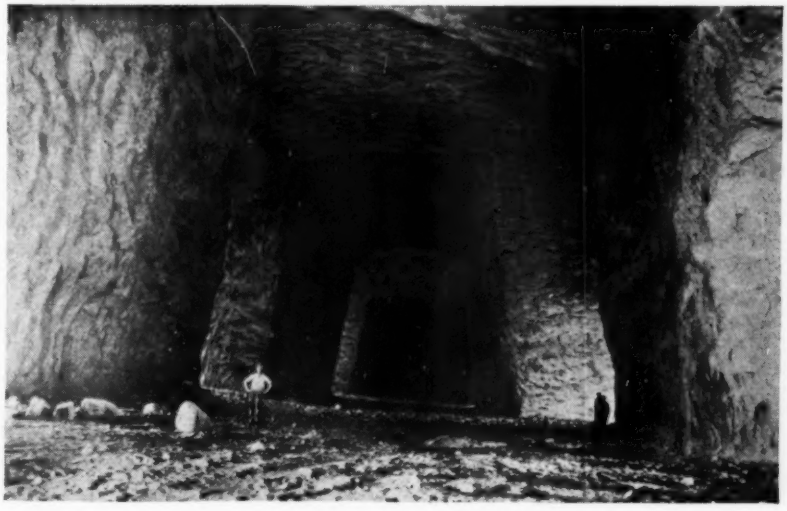
The high roof development is confined at present to the original or first level and roof salt is made available in huge piles. During the early part of 1938 a standard Bucyrus-Erie electric shovel was installed on the first level for loading. This shovel is equipped with an 18-foot boom, 14-foot 6-inch dipper handle and 5/8-yard dipper. It is powered by a 30 H.P. alternating current electric motor and has at times handled from 140 to 150 tons of salt per hour for an 8-hour shift.

Maintenance of the two shovels is directly supervised by the assistant mine foreman and regular inspections are made of all equipment by the maintenance superintendent.

One Locomotive In Use On Each Level

Two 4-ton Goodman two-motor locomotives with electric cable reels and operating on 220 volt

(Continued on page 118)



• There are many miles of these huge, abandoned chambers on the 800-foot level. The roof, which is 85 to 100 feet high, is supported by the great salt pillars shown here.

Engineers Revive old Aztec Construction Methods In Mexico

Most notable example of present method is the Guardiola building being constructed as an addition to the Bank of Mexico

BY JACK STARR-HUNT AND CHARLES H. BOND

MEXICO, land of music and romance, owes much of its picturesqueness and appeal for the American to the fact that its general lack of imposing edifices makes its skylines drastically different from any in the United States.

The possibility that all this may soon change and that Mexico City, long troubled by the problem of a sedimentary sub-soil, may one day see fifty-story buildings arising in its midst, is seen by George A. Moreno, contractor in charge of the foundations in Mexico's newest building being built by the Bank of Mexico.

The sub-soil of Mexico City has long been a construction problem. Ever since the Aztecs first selected the ground for the foundation of

• Left: The Palace of Fine Arts, a ten million peso building resting on a concrete mat, has sunk over seven feet. Right: The Monument to Mexican Independence in the beautiful Paseo de La Reforma—the first successful attempt to combat the weak sub-soil through the use of piles.

Tenochtitlan, as the Mexican capital was first called, builders have faced the same difficulty. The site of the city of Mexico was once a huge lake surrounded by firm mountains. Through hundreds of years, the sedimentary deposits of these mountains, washed down by rains, have built up the lake bed to 7,200 feet above sea level, its present elevation. Naturally, ground of this nature is shifty and unstable, causing engineers to have to dig approximately two thousand feet to reach bedrock whereas in a city like New York, twenty or thirty feet suffice.

Aztecs Develop First Plan

For the solution of the problem of building heavy temples and other buildings on such soil, the Aztecs consolidated the upper strata of the ground on which they were to build. This they did by driving stakes, approximately five inches in diameter and three to six feet in length, close together in the ground. Through this method they increased the bearability of the ground from the three to five hundred grams per square centimeter (.3937 inches), which it formerly possessed, to from eight hundred to a thousand grams per square centimeter.

Following the Aztecs came the Spaniards, building heavier structures and adding to the Indians' consolidation the wide foundations and walls characteristic of the old world. But neither the old Aztec structures nor the later Spanish buildings resisted the pulls of the unfirm soil and today the greater part of Mexico City's colonial buildings have sunk deep into the ground.

Palace of Fine Arts Sinks

Entering upon a more modern era, the Mexican builders unwisely abandoned the consolidation methods of the early Aztecs. They substituted a heavy reinforced concrete mat upon which they erected their building. This innovation failed in the great majority of cases. The principal example of the failure of this system is Mexico City's ten million peso Palace of Fine Arts which took thirty years to complete and which to date has sunk seven feet.

• When a building sinks it forces nearby ground down with it. The sidewalks, however, do not always sink smoothly, resulting in cracks like those shown here.

During this more modern era of building, many artesian wells had been dug throughout the city in an effort to get purer drinking water for the capital. With the digging of these wells came the knowledge that at varying depths throughout the city, there existed a very hard, resistent stratum of sedimentary deposits. Contractors toyed with the idea of using this as a foundation bed for heavy buildings but they were not quite prepared at the time to take this step.

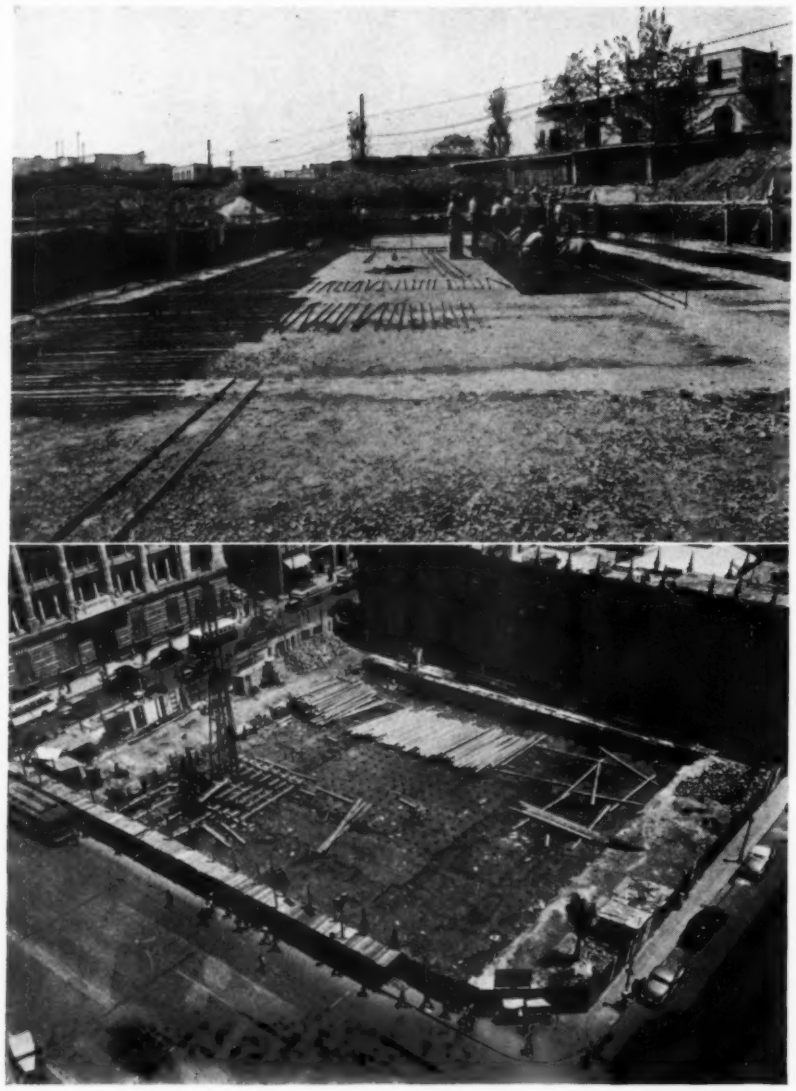
Twenty years ago, however, Mexico's Dictator-President Porfirio Diaz gave an order that, on one of Mexico City's main driveways, a monument should be erected to the Mexican struggle for Independence from Spain. Accordingly, a tall, heavy monument approximately six stories high and mounted on a concrete slab was begun. As the column arose, however, it settled and leaned to one side.

Faced with the problem of either maintaining the monument erect or discontinuing its erection, engineers tried several different methods without success. Then it occurred to them to try the ancient Aztec's method of consolidation. Long piles were driven into the ground until bedrock was reached; concrete was poured over the heads, and upon this base the monument was erected. It has stood erect and unsinking ever since.

Area of City Increases

For a time after the solution of this problem, the method was forgotten, principally perhaps because the city of Mexico grew faster horizontally than vertically and nobody thought of checking this spread. Within the last few years, however, as the City approached an area comparable to that of London, it became increasingly obvious that some sort of check must be found through the erection of taller buildings. The cost of government was increasing. Whereas an area of a city block contained thirty or forty people, an equivalent area in New York city contained thirty or forty thousand. The cost of servicing, public utilities, policing, etc., was climbing at an alarming rate.

Five years ago the first step was taken toward the erection of an



• Top: Workmen on a reinforced concrete foundation of the type used in the Palace of Fine Arts. Bottom: Birds-eye view of work being done on the Guardiola Building, showing the piles and holes where they have been driven.

American-style office building, the ten-story "La National" edifice in the heart of Mexico City. In preparing for this building, the contractors recalled the methods used in building the monument to Independence and decided to try it out on a really heavy edifice.

Once again engineers drove down to bedrock and put pile after pile into the soft soil until they had reached the solid structure. After three hundred and sixty-eight piles were driven, the concrete layer was placed on top and the building erected. It was several thousand pounds heavier than the National Palace of Fine Arts and contractors watched the experiment apprehensively before attempting any other building along similar lines. In spite of its greater weight, however, the "La National" building has sunk only one centimeter (.3937 inches) in five years as contrasted to the seven feet of the Fine Arts building. Contractors predict it will sink no more.

Success Brings Building Boom

The success of the experiment met with an immediate reaction which resulted in a building boom such as Mexico had never seen. Even in 1938, which was a year of general unrest for Mexico, government figures show that over three and a half million pesos were invested in the capital city alone. This amount is greater than the figure registered at the same time in 1937.

Mexico City's fashionable Hotel Reforma was built along the same lines and rests on a trustworthy foundation. At present, at least four office buildings, the Supreme Court building and the addition to the Bank of Mexico, known as the "Guardiola" building, are being erected. Also, projects for buildings during 1939, as revealed by the government Registration Bureau, include six office buildings, two motion picture houses, one department store, forty-two apartment buildings, and four churches. All this is being done in Mexico's most serious era of depression!

One reason that the building boom has come so suddenly is that Mexico, though it had found a solution to its weak subsoil, was greatly handicapped on the practical end. Modern pile-driving equipment is costly and beyond the means of most Mexican contractors. They therefore used makeshift equipment composed of small, lightweight, drop-hammers operated by gasoline motors. The lead towers of such pile-drivers were very small and as a result it was necessary to use a number of small log sections to complete a pile of the required length, usually from a hundred to a hundred and twenty feet. With such methods, the pile-driving often proved very costly, too costly to permit prospective builders to make up their minds about beginning construction.

New Company Organized

The problem of expense was carefully studied for over two years by the Raymond Concrete Pile Company of New Jersey with a view of establishing a company in Mexico. After complete investigation, a Mexican company called "Cimentacion de Construcciones S. A.", was organized by the New Jersey Company, but the management remained entirely Mexican. The capital is two-thirds Mexican and one-third American.

Most notable example of the

work of this new organization, and one which will serve to describe at length the methods now being used, is the Guardiola building being built as an addition to the Bank of Mexico. Finding insufficient space for their vaults, officials purchased a block of land in the heart of the city and decided to build five vaults there to house Mexican government funds and to build a nine story building above the vaults.

The project calls for the building to have three subbasement stories in an excavation forty-four by forty-four meters by 10 meters in depth. Over this will be built the nine stories for office purposes. The entire weight of the building will be an estimated thirty-two thousand metric tons.

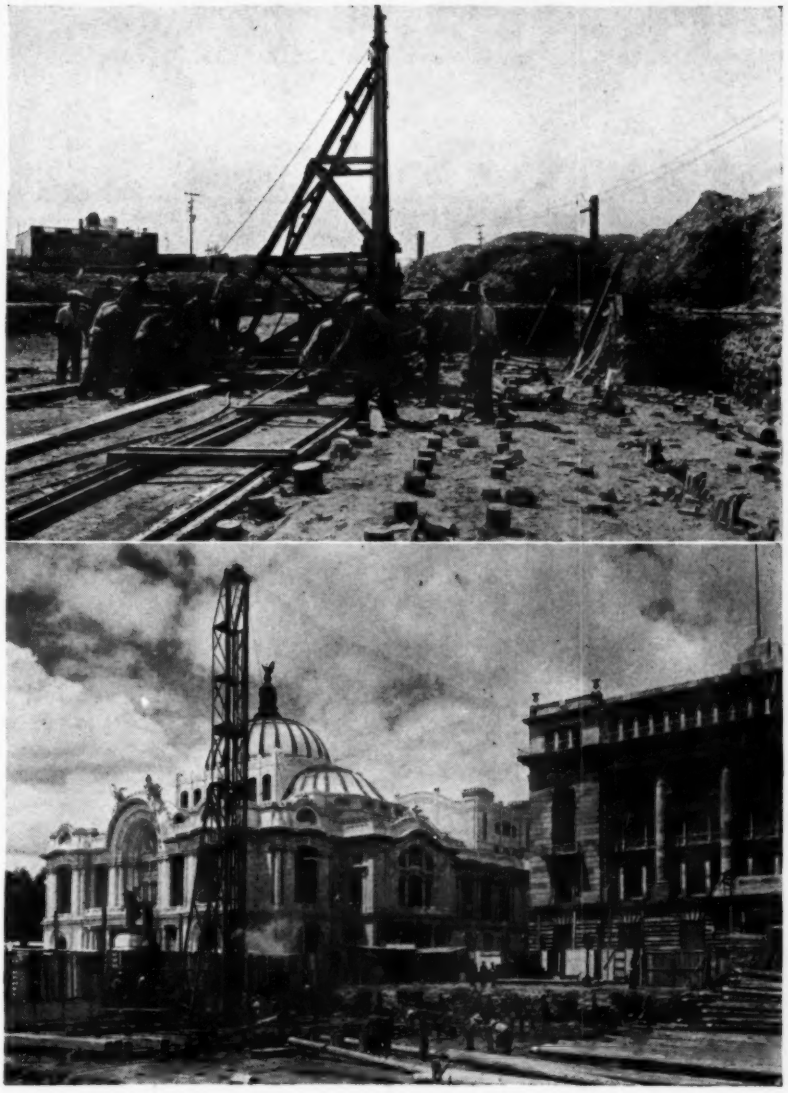
Use American Equipment

The equipment used in constructing the foundation is American-made, and is much more efficient and swift, greatly reducing the time and cost of building. It includes a number two Vulcan hammer weighing three thousand pounds, which drops thirty inches to strike the pile. An average of 1800 blows is necessary to drive the twenty-seven meters (88½ feet) of wood pile plus six or seven meters (approx. 19 to 23 feet) of follower which is allowed to project slightly above the ground for later covering with concrete. When each pile is driven down to refusal it is tested to determine how many tons it will hold. The test consists of a series of 10 to 15 blows with a 3,000 pound hammer and careful observation of the penetration as a result of the blows.

The building when finished will rest upon a total of 1,156 piles a meter and a quarter (approx. 50 inches) apart, resting upon a hard rock stratum which has been found to be six meters (approx. 20 feet) thick approximately thirty-four meters (112 feet) below the surface.

Mexican Timbers Used

The wood piles are made from Mexican timbers, from a kind of spruce tree known as Oyamel. The heads of the piles will stand out half a meter (20 inches) from the bottom of the ten-meter (33-foot)



• Top: One of the first constructions on which a pile-driver was used. This, however, was one of the earlier pieces—small, slow and expensive. Bottom: Here is the steam-driven pile-driver at work. At the right in this picture is part of the Bank of Mexico while in the background is the Palace of Fine Arts.

excavation and the space between these, according to George A. Moreno, the contractor in charge, will be filled in with a mat of reinforced concrete which will imbed the piles. Over this will be another mat of reinforced waterproof concrete one and one half meters (59 inches) thick. The walls of the basement will also be waterproof reinforced concrete.

Through these methods, explains Mr. Moreno, there is no danger of the logs deteriorating because the piles are ten feet below the street level, or seven and a half meters (24½ feet) below the present level of the ground water. Thus, the piles will be continually buried in water and will not decompose. There is a possibility, however, that eventually they may petrify and thus form permanent stone shafts down to bedrock which will hold the building as long as any built on a directly solid foundation. Little by little, he adds, Mexico will continue this method in her buildings and, with the innate eye for beauty of every Mexican, may one day be the most beautiful city in North America.

"The Best Pilots Stand On the Shore"

• Left: This is how the Sidewalk Superintendents' Club looks from the street. Right: Each end of the "Club Building" carries the coat of arms shown here. The translation of the sentence at the top is "The Best Pilots Stand On The Shore."

Enthusiasts of one of the greatest free pastimes have at last come into their own and are taking full advantage of all opportunities.

BY M. FRIEDLANDER

TIME marches on. Troubled times or no troubled times, one oppressed party, at least, has finally come into its own in a big way. Future generations will look back on the day when the first Sidewalk Superintendents Club in history made its appearance at the east end of the George J. Atwell job in New York City.

Operations began on October 6, and neither superintendent Frank Brennan nor Mr. Atwell himself had any premonition of what would follow before long. The work consisted of excavating for a foundation for Rockefeller Center's new sixteen story Holland House. About 25,000 yards of earth and rubbish and 58,500 yards of rock, (mostly mica schist) were to be removed from the hole which was to be dug to depths of thirty and thirty-five feet below street level. Just an ordinary, every day, garden variety of contract on a 203-foot by 310-foot lot in the heart of New York City. Nothing unusual, so you would have thought.

The contractor employed two 1¼ yard shovels and a crane to load twenty-five ten yard (water level) trucks which hauled material approximately a mile and a half. Below the top eight feet or so of soft stuff, ten jack hammer and two wagon drills, operated by a battery of five Ingersoll-Rand standard compressors, were used on blasting holes. The wagon drills were fitted with 1⅛" steel up to twenty-five feet long while the others operated with one inch steel and shorter lengths. Forty per cent dynamite was deposited in holes as much as twelve feet deep and the use of explosives was carried on throughout the two shifts, from 7 A.M. until 11 P.M. No time of completion was set, but the

• Left: This is what holds the interest of the spectators. Right: Here several members of the club watch carefully as the work proceeds. One of the gentlemen in the center is no doubt telling the other just how he would do the job.

work was expected to be finished by February 1, 1939.

It is important to know at this point that the Rockefeller Center job, in common with many others, was surrounded on all sides by an eight foot fence, unbroken except where the truck ramp reached street level. Here it was customary for curious onlookers, as they had done for four thousand years since Queen Semiramis' day, to crowd one another and try to catch a glimpse of what was going on inside. Risking their lives under the wheels of automobiles, they patiently bore the discouraging remarks of guards day after day.

Spectators Persist

In spite of obstacles, with the doggedness of faith, a group of passers-by was always gathered to watch and wonder at the sight of a shovel taking a hard bite, or a two ton boulder being lifted into a truck. And before a blast, it is not too much to say that exclamations of ecstasy were heard in anticipation of the fun. But the spectators had a tough time of it. The opening was small. Their attention was constantly being distracted by the guards or their vision blocked by loaded trucks.

At this point something happened which turned the course of those four thousand years of history. Some people are still wondering if it was a good fairy that led John D. Rockefeller, Jr., past the work one day. Because Mr. Rockefeller, being very human, felt his interest aroused and stopped to regard the proceedings which were now going on well below street level. There is no accurate report as to how long he stood there. It doesn't matter much, anyway. What does matter is that suddenly a voice broke in on his thoughts. Looking up Mr. Rockefeller saw a uniformed guard glaring straight at him and saying, "Better move on, buddy. You had better move on before you get hurt."

Right there was the very beginning, the germination, we might say, of the Sidewalk Superintendents' Club. Mr. Rockefeller thought that watching was fun. He liked to watch, and he resented the interruption of his innocent pleasure. Apparently, a lot of other people liked to watch too, and why shouldn't they? After all, no harm was done. He gave his secretary a few orders and shortly afterward carpenters began to remove the east fence. On November 10, the Club was formally opened to the public and after that time anybody with a desire to watch the progress of the Holland House excavation could do so to his heart's content and in perfect peace.

The Club proper consists of a roof over the sidewalk and a wire barrier, replacing the old wooden one, which provides for safety of sidewalk engineers without impairing their view. As an additional precaution, board flaps are let down over the wire during blasting to guard against small flying particles. About eighty feet long and painted a neat gray, the Club displays on either end a coat of arms never before seen on land or sea. A steam shovel, an industrious beaver, a dutch windmill and a hammer striking a watch (killing time) appear above the motto, printed in Dutch, "The Best Pilots Stand on the Shore."

Have Membership Cards

Membership cards and a suggestion box are parts of the Club. During the 30 odd days from November 10, (date of opening) to December 10, 35,000 persons asked for club membership cards and about 200 took advantage of the suggestion box.

Among suggestions offered were swivel chairs, and loud speakers to enable the onlookers to kibitz noisily for the benefit of the workers. One member suggested the serving of coffee and doughnuts while another liked that idea but thought cocktails would be better. Three out of towners wanted blonde guides and others requested hostesses.

Among the more sensible suggestions were a special section for short people and the ejection of women with long feathers on their hats.

Daily, and beneath powerful floodlights at night, crowds of watchers, their noses pressed against the wire netting, stand and gaze and gaze.

Your correspondent wishes to be excused now. He feels the urge to go and watch Mr. Atwell's shovels.

Equipment

you ought to KNOW ABOUT

Road Profilometer

A new instrument for taking the profile of highway paving is the Kriegil Road Profilometer, a development of France Stone Company.

Built entirely of aluminum, the profilometer consists of a seven-inch channel, eleven and one-half feet long, supported by leveling screws. On a carriage which rides on the channel is mounted a double arm, one end of which bears on the paving and the other end of which carries a pencil. As the carriage is moved over the road surface the pencil scribes an accurate record of the road profile on cross-section paper held in the web of the channel. The profilometers weighs only fifty-seven pounds, enabling one man to handle and operate the device.

Rex Tunnel Liners

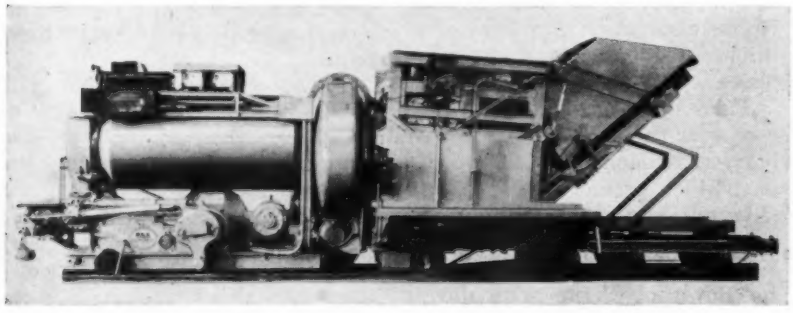
The Chain Belt Company of Milwaukee has just shipped one of two Rex Tunnel Lining Machines for concreting operations on the Gunpowder Falls—Montebello Tunnel is part of the water supply system for the City of Baltimore. This tunnel will extend a total length of 7 miles with an inside diameter of 12 feet and will require about 70,000 cubic yards of concrete. To handle this concreting job, the Chain Belt Company designed and constructed two tunnel lining machines.

There are two separate cars to the unit—a mixer car weighing approximately 18,000 pounds and a Pumpcrete car weighing approximately 16,000 pounds. Each car is on flanged wheels with individual traction drive to operate on 36 inch gauge tracks. The two cars are designed to work close coupled. At the extreme right of the photograph is one of the 15 batch cars which will be used to charge each mixer. The mixer car carries the mixing drum which has the same diameter as a standard REX 28-S drum, but lengthened out to take a 1½-cubic yard mix. The discharge is then directed into a transfer drum on the Pumpcrete car.

Closely spaced inside the bulge end of the transfer drum pictured are buckets which carry the concrete from the mixer discharge up and onto a chute into the long cylindrical transfer drum or rotary remixer from which the concrete is discharged into a REX 200 single Pumpcrete and pumped through an arch pipe into the forms.

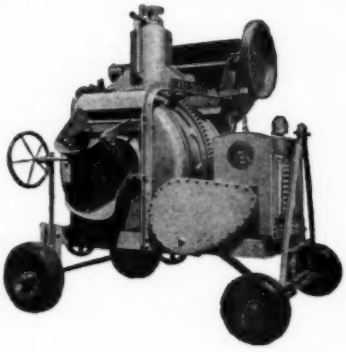
Burgess Snubber

A totally new type of noise-quieting device which is non-acoustic and can be placed at any point in the intake or exhaust system of an engine or compressor, has recently been developed by the Acoustic Division of the Burgess Battery Company, 500 West Huron Street, Chicago. Since it eliminates the cause of noise produced by the pulsating gases by snubbing the peak velocities and pressures and thereby produces a smooth flow of gas, this new device is called the Burgess Snubber.



7-S and 10-S "V" Mixers

The Ransome Concrete Machinery Company, Dunellen, New Jersey, claims they give the contractor greater economy, better mix, higher production, and lower maintenance with their latest 7-S and 10-S model "V" Mixers.



A few of the features which the manufacturer claims back their statement are the heavy steel channels welded in a one piece chassis with two extra cross members for drive support and two extra longitudinal members for drum and roller support which provide an extra degree of resistance and strength against strain, wear, and shock.

Also, an exclusive mixing action results from the patented mixing blades which produce an extra fast and thorough mixing action. To prevent grit or dirt entering into the motor, a screen type air cleaner is used. The mixers can be obtained with two or four wheels for side or end discharge.

Scarifier Teeth

Scarifier teeth with renewable points, designed to lower maintenance costs and produce a more effective job, have just been announced by the Caterpillar Tractor Company. These scarifiers have stronger shanks, tipped with points of special alloy steel, and are designed to fit all current and non-current Auto Patrol models, and almost all models of "Caterpillar" Blade Graders.

New Filter Underdrain

A new design in vitrified clay sub-drainage pipe has been announced recently by The Robinson Clay Products Company and is now on the market under the name: "Robinson Skip-Pipe."

This new underdrain is of the bell and spigot type, semi-circular in shape. A superimposed cradle is an integral part of the pipe, and is somewhat shorter than the entire length to provide extra-rapid drainage under all operating conditions.

Skip-Pipe may be used on many types of jobs, including Highway Construction, Railroad Right-of-Way, Residential Cellars, Building Foundations, Sewage Disposal Plants, Athletic Fields, Airports, or wherever quick underdrainage is essential to normal operation. It is available in five sizes from four inches to twelve inches in diameter.

Complete information and specifications of Robinson Skip-Pipe are contained in a new illustrated catalogue and can be secured by writing The Robinson Clay Product Company, Akron, Ohio.

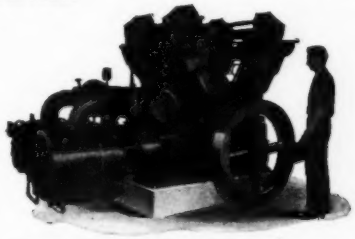
Chain Drive Trucks

The Hug Company, Highland, Illinois has announced a new series of Chain Drive Models ranging from 10 to 25 yd. capacity. The Model 98-CD is a single axle Chain Drive Model and comes equipped with 10 to 12 yd. power hoist body; the Models 98-MB and 99-MA are both dual axle Chain Driven Models with body capacities of 16 to 25 cu. yds. respectively.

The Chain Drive Models are built for heavy duty quarry, dirt and rock operations. The specification features include heavy duty six-cylinder truck engine, gas standard with Diesel equipment optional at extra charge and 8-speed unit transmission. The new Chain Drive Models are available with various types of body equipment. The standard body equipment consists of the Boulder Dam Type Body with outmounted telescopic hoist.

Diesel Compressor

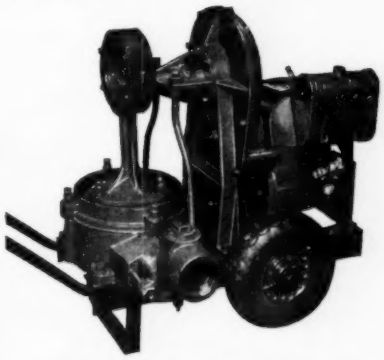
A new heavy-duty Diesel-engine-driven compressor, known as the "XVO," has just been announced by the Ingersoll-Rand Company. This machine is designed for use wherever economy is a primary consideration, in independent or isolated compressor plants, or when existing power facilities are overloaded. It is recommended for use in mines and quarries, construction and contracting, drill barges, air-lift pumping and general industrial service.



Detailed information is contained in a 16-page bulletin, form 3072, copies of which are available from the Company, 11 Broadway, New York City, or any of their branch offices.

Diaphragm Pump

Novo Engine Company, Lansing, Michigan, announce a new, light-weight, compact 3" Diaphragm Pump. Although forgotten in the rush to switch over to other types of pumps, the Diaphragm still has a definite place in the picture for dewatering jobs on construction work. Here, the need often arises for a pump with the ability to handle seepage as well as water ladened with foreign matter, dirt, sticks, etc.



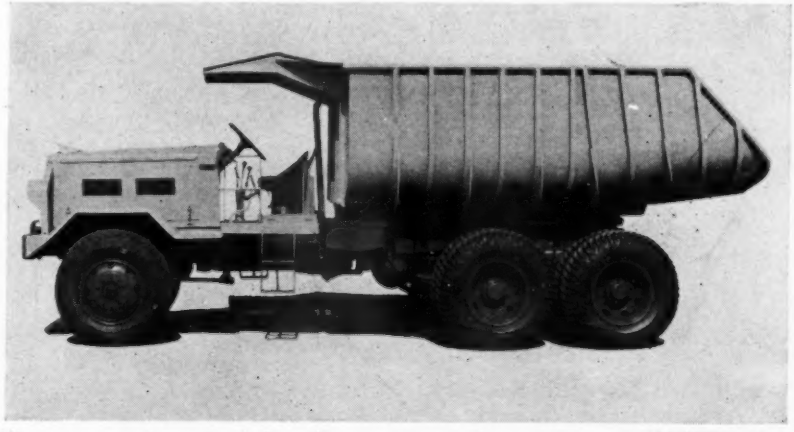
A 2½ H. P., air-cooled anti-friction engine is close coupled to the pump which, when skid mounted, weighs 370 lbs. It can be mounted on a two wheel, steel or pneumatic tired truck.

Twin-Motor Tractor

The Gear Grinding Machine Company, Detroit, announces the introduction of the Grico Twin-Motor Tractor. This new unit has been designed for adoption on Ford trucks exclusively.

The new Twin-Motor unit consists of the conventional standard Ford cab-over-engine short wheel base truck to which has been added a second engine placed immediately back of the cab. The second engine drives another set of wheels through its own drive shaft and rear axle. Combined horsepower of the two 95 horsepower motors is 190, with a corresponding increase in rim pull and torque.

Performing alone, each motor is run by its individual controls. When the two engines are working together they provide dual operation in every respect with the exception that there is a single throttle, single gear shift lever and single brake and clutch pedals.



Electric Plants

D. W. Onan and Sons, 43 Royalston Avenue, Minneapolis, Minnesota, manufacturers of alternating current generating plants are announcing new models of 2000 and 3000 watt, water cooled, AC generating units.

(Continued on page 116)

EXCAVATING ENGINEER

A Monthly Publication
Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

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Fifth Consecutive Year of Construction Gains

The year 1938 was the fifth consecutive year of increased construction volume, according to F. W. Dodge Corporation. Residential building had the largest dollar total since 1930, and total building and engineering expenditures were practically equal to those of the year 1931 and greater than any year since 1931. While public construction expenditures represented 52 per cent of last year's total volume, privately-financed building and engineering work was greater than in any post-depression year except 1937. Private construction during 1938 ran 16 per cent behind 1937, but 10 per cent greater in volume than in 1936. Significant increases in private construction contracts accompanied the mounting volume of public works projects in the closing months of 1938.

The year's gains over 1937, as measured in dollar volume of contracts, were as follows: heavy engineering public works, 40 per cent; public and institutional buildings, 28 per cent; residential building, 7 per cent; public utility construction, 6 per cent. Lagging considerably behind, in close sympathy with the lack of confidence that characterized business and financial sentiment during most of the year, were commercial and industrial building. Commercial building expenditures dropped 28 per cent behind the preceding year, and industrial building dropped 61 per cent. The year closed with total construction expenditures 7 per cent greater than those of 1937. Contracts awarded from January 1 through December 21, 1938, in the 37 Eastern States, amounted to $3,054,417,000 compared with $2,861,993,000 in the corresponding period of 1937.

The gains of 1938 occurred in the later months of the year, and continued without interruption through December. Carrying over into the new year are the remaining projects of the current P.W.A. program, almost the entire Federal program of public subsidized housing, the moderate upward trend in utility construction, and strong indications of large volumes of private residential building still to come.

For 1939 as a whole the outlook is very promising for increased volumes of residential, commercial, industrial and public utility construction; on the assumption of reduced Federal aid to local public improvement projects, decreased volumes of public and institutional buildings and public engineering works are considered likely, with a substantial net increase in total construction highly probable.

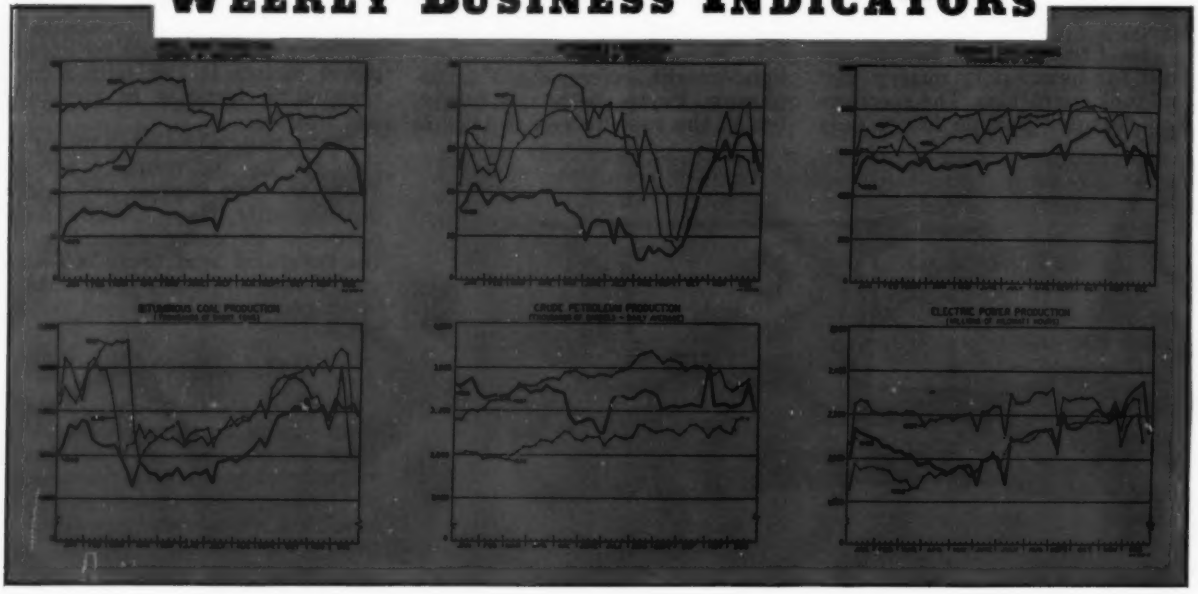
Do You Want Copies of "Who Pays the Taxes?"

The editorial on the next page, is the seventh in a series of 12 articles explaining the American business system. Excavating Engineer is presenting the series, which is adapted from Bulletins issued by S. D. Warren Company, because they tell the story of our system simply and clearly. Reprints are available if you wish them to distribute to your employees.

You can get reprints by simply sending us one cent apiece for each copy of the reprint you want. (Minimum order is 10 copies).

Reprints of the six articles published are available at the same nominal price. Articles still to be published include: "Who Sets Prices?"; and "Who Determines the Wages of Employees?".

WEEKLY BUSINESS INDICATORS



Who Pays The Taxes?

EVERYBODY pays taxes. Taxes are the money that is collected to pay the expense of government. Some of the taxes are collected directly from the people. Others are collected indirectly so that people don't know that they are being taxed. But everybody is taxed one way or another.

All taxes must come from the proceeds of business because business produces all the income of the people of the United States. The farms, the forests, the mines and other natural resources are the natural wealth of the country, but they don't provide any income until they are cultivated and developed by business men for business use.

The farming business cultivates land to grow foods and other crops which may be sold and used. So the farming business produces considerable of our national income.

The mining business tunnels into the land for ore and coal which may be traded for something of value or sold for money. So the mining business produces income.

The transportation business moves products to points where they can be used and thus adds to the value of the products and thus adds to the national income. Manufacturing businesses take the raw materials from farms, forests and mines, and convert them into buildings, furniture, automobiles, medicines, foods, clothing and many other products that can be sold. Thus, manufacturing businesses add to the value of raw materials and so produce income.

Governments do not produce any income. They merely take a commission on the national income. That commission is called a tax. City, state and national governments are not producers. They are the watchmen and referees that are employed by the people to enforce rules that will protect the people.

It is necessary that rules be established and enforced to protect good citizens from the effects of unfair treatment, fire, crime, disease and other evils. So town and city governments are employed to enforce rules to protect individual citizens from each other, to protect homes against fire, to protect public health, to provide schooling and to look after all other public interests of the local communities.

State governments are employed to enforce rules to protect the interest of each country community, each town and city so that none can gain any unfair advantage over the others.

The national or federal government is employed to protect the combined interests of all states and to enforce rules that will assure each state fair treatment from all other states.

All of these forms of government are necessary for the peace and safety of the people of America and so the expenses of these governments must be paid. But inasmuch as these governments produce nothing, they cannot be self-supporting so their expenses must be paid by the people who employ them. Every citizen or resident of the United States must chip in.

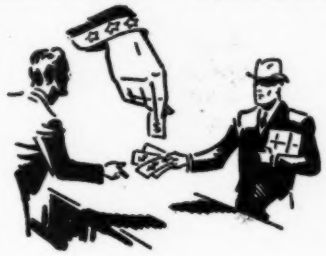
Nobody escapes the payment of taxes. People who think they don't pay taxes are mistaken. Everybody chips in. About one-fifth of America's national income is taken in taxes by federal, state and city government. That means that, when the people of America produce five dollars' worth of goods, they must turn one dollar of it over to the government to pay the expense of government. Thus, of the five dollars produced, only four are left to be divided up among the people who combined their efforts to produce the five dollars.

Of course, taxes are not taken in just that way. If they were taken that way, everyone would know that he had paid them. Taxes are taken in a different way. They are added into the cost of goods and when people buy the goods they pay the taxes without knowing it.

The mining businesses pay taxes and add them into the cost of ore and coal. The steel mills pay taxes and add them into the cost of steel. Manufacturers of steel products pay taxes and add them into the cost of the goods. Wholesalers pay taxes and add them into the cost of goods. Retailers pay taxes and add them into the cost of goods. Business must either subtract taxes from wages or add taxes into costs or go out of business. Generally they add the taxes into the cost of goods.

So when people spend five dollars for food or clothes or nails, they receive about four dollars' worth of goods and a dollar's worth of government.

Taxes are included in rent, in the price of gasoline, cigarettes, beer, bread, meat, shoes, hats and in everything else that people buy. They represent every person's share of the expense of government. If the government is secured at a low cost, everyone pays less for goods and so gets more for his wages. If the cost of government is high, everyone pays more for goods and so gets less for his wages.



At the present time the cost of government is the highest that it has ever been in the history of America. The estimated tax bill for 1938 is $100 per person for every one of the 130 million men, women and children in the United States. And nobody will escape payment.

Simplifying County Maintenance Problems

Three cut and fill jobs are quickly and economically finished to the complete satisfaction of Clay County, Missouri, officials.

By KENNETH FORCE

THREE tough, but not especially unusual, road building jobs have demonstrated conclusively to Clay County, Missouri, officials the ability and flexibility of the 2-wheel scraper and 40 H.P. tractor as a dirt moving unit.

The first of the three jobs, which took place more or less in the nature of a demonstration, was located two miles west of Liberty, the county seat. Here, in order to avoid an embankment with a 13-foot drop, the highway made a sharp bend and crossed a low swale. To reduce the sharp curve it was necessary to cut down the embankment and use the dirt to fill in the swale.

It was here the 2-wheel scraper proved its flexibility. By backing the scraper over the edge just far enough to slice off a load it was possible to cut down the embankment and, by back-dumping over the edge again, fill in the swale sufficiently for the tractor-scraper unit to work forward. From this point it was a simple matter to finish cutting down the bank and smoothing out the slope.

It was the first time Gilbert Denny, county engineer, had seen anything like this accomplished and he strongly approved of the way it permitted him to make a gradual curve out of a very dangerous sharp bend.

The second job was located 2½ miles east of Liberty, near Missouri City, where the country road made a sharp dip approaching a bridge. In order to fill in the dip, dirt had to be taken from the top of a hill about 1,300 feet away. This job, done by and for the county, required two weeks of nine-hour day shifts.

The scraper and tractor averaged eight trips per hour on the 1,300-foot (one way) haul. The tractor worked in low gear for the 35 to 50 feet required for loading and then shifted into high gear for the trip to and from the fill. The full loads being carried by the scraper consisted of soil typical of that county, specifically gumbo and clay with only a trace of rock.

The 14 quarts of lubricating oil required by the tractor were changed every 50 hours and from 12 to 14 gallons of fuel were used every nine-hour shift. As the equipment is new there have been no maintenance costs.

"After several months use, we like the equipment very well," commented Mr. Denny. "Simple in operation, it doesn't have a lot of gadgets that break down easily and are difficult to fix or replace. It should be simple to keep up. We particularly like the flexibility of the equipment, which we can use to cut down steep banks with a minimum of time and effort."

As this is written this same tractor-scraper unit is being used on a road 1¾ miles northwest of Kearney, where the county is cutting down abrupt banks on both sides of a culvert. The road turns abruptly at the culvert, crosses it, and turns again, making good visibility highly desirable. On the east approach to this job it is about 300 feet to the dump. Approximately 30 feet are required for loading in the material on this job.

That operator Clevenger likes the equipment is apparent from his statement, "We can fill dumps easily and cut sloping banks. It operates everywhere other equipment does and goes into situations other equipment can't.

• **Left: The Bucyrus-Erie 2-Wheel Scraper dumps a load on the culvert job northwest of Kearney. Right: This Caterpillar grader is used to put the finishing touches on the Clay County jobs.**

Dependable POWER!

by Ewing Galloway, N.Y.

The two farm plugs shown at the right wouldn't thrill the crowds at the horse show. They would evoke even less interest at the Kentucky Derby. But down on the farm the owner regards his horses from another viewpoint—Dependability.

These are just plain plow horses that will pull a deep furrow day in and day out without kicking over the traces. They are gentle, even tempered, powerful—and above all Dependable. Just the kind of horses that any contractor would prefer if he took up farming.

Contractors can get the same dependable power in an Atlas Diesel—an engine of the medium speed, heavy duty type, ruggedly built to withstand the beating that construction machinery must take.

Atlas Diesels are available in a wide range of sizes for powering excavating equipment, locomotives and cranes, as well as electric generators, air compressors, pumps and dredges. Built in stationary and industrial types and also available as self contained power units. Contractors inquiries are solicited.

ATLAS IMPERIAL DIESEL ENGINE CO.

Eastern Division
115 Broad Street
New York, N. Y.

Central Division
228 No. LaSalle St.
Chicago, Illinois

Western Division
1000 Nineteenth Ave.
Oakland, California

Gloucester - Baltimore - Providence - Philadelphia - Charleston - Miami - Jacksonville - Tarpon Springs - New Orleans
Fort Worth - Houston - El Paso - Terminal Island - Seattle - Portland - Vancouver - Ketchikan - Honolulu - Manila.

ATLAS IMPERIAL

For your convenience in writing to Atlas Imperial Diesel Engine Co., you will find a card bound in this issue.

Shots from the FIRING LINE

New Mechanical Finisher Is Watched on California Highway Job

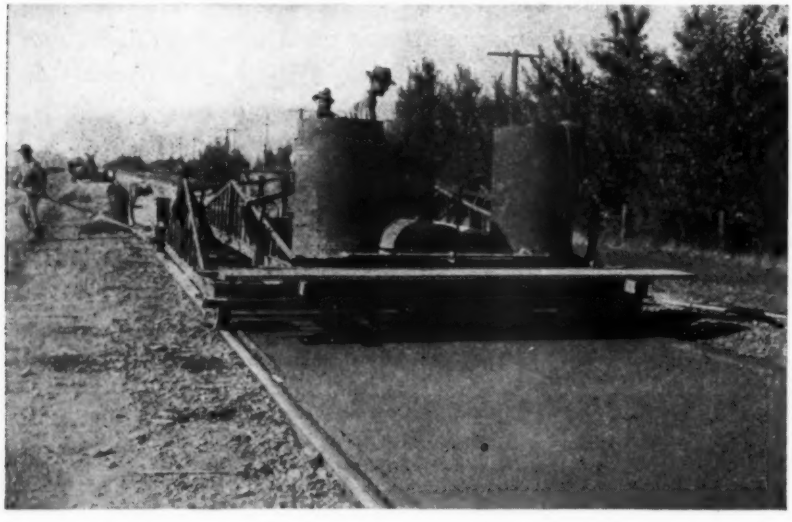
Southern California road builders are watching with interest the performance of a new piece of equipment just put into use on the new alignment of State Highway 23, known as the Mint Canyon Cut-off. This machine is the Johnson Float Finisher, designed by H. D. Johnson, who has been associated with the California Division of Highways for many years, and C. S. Shultze, and developed and manufactured by the Madsen Iron Works, of Huntington Park, California. The machine eliminates the finishing work formerly done by hand and while still in a more or less experimental stage, it has shown exceptional speed and smoothness. For example, on a job at Huntington Park it finished 465.7 yards a day with a smoothness of 3.5 inches per mile, an exceptional record for smoothness, according to State Highway Engineer Earl Withycombe.

Later, with a mechanized power unit perfected and added, the machine was credited with being largely responsible for the record-breaking paving job of the Mountain States Construction Company at Eugene, Oregon, where 6.37 miles of 22-foot pavement was laid in 33 days.

The machine consists of a rigid steel frame mounted on a 23-foot wheelbase consisting of two truck units. The frame supports a series of mahogany cutting blades 6" wide and 2½" thick. These are set at an angle to the pavement and form one X and several V sections. The blades are all vertically adjustable to insure conformity to a predetermined cross section. Vertical curves are cared for by a unit which raises or lowers the blades as necessary. The whole unit can be lowered or raised to bring the blades into contact with the pavement or clear them for moving the machine for a considerable distance.

A heavy roller is placed at the front end of the machine in such a manner that it rests on the concrete, depressing the larger material and working mortar to the surface. A spray bar which works from a water tank mounted on the finisher directs water on the roller, practically eliminating hair checks and preventing premature drying in hot, dry weather. The machine can be operated by one man. Its speed is limited only by the paver, and it is said to reduce finishing costs considerably.

• The Johnson Mechanical Float Finisher which will be used on the Newhall Tunnel elimination job.



• • A 160 cubic foot LeRoi two-stage Portable Air Compressor driving clay spades on a municipal job for the city of Milwaukee, Wisconsin.

Not only those interested in construction, but the general public has displayed a great deal of interest in the construction of the new highway on Route 23, the feature of which is the elimination of Newhall Tunnel in historic old Fremont Pass.

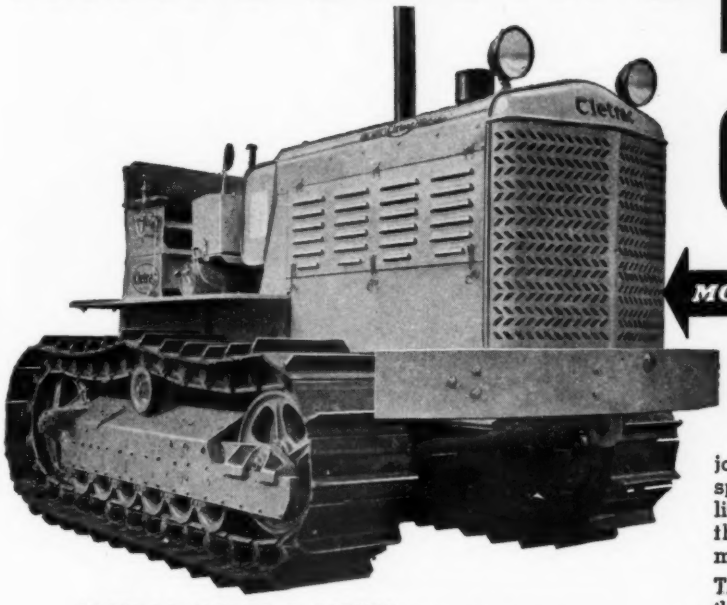
This pass, some 30 miles north of Los Angeles, through which padres, Spanish outlaws, and General Fremont's army all made their way in former years, has been for more than a century the only gateway between Los Angeles and the valleys to the north. Approximately a million and a half cars and trucks traverse the road yearly, and all of this traffic had to pass through Newhall Tunnel, located at the summit. This narrow bottleneck, 17 feet 5 inches wide and 435 feet long, was a serious traffic handicap. The State Highway Department last year appropriated funds for its elimination and replacement by an open cut, and for the construction of 7.25 miles of modern highway to cut across a V on Route 23 just north of the tunnel.

The contract for the first part of this work, 3.75 miles, including the tunnel elimination, was let to the Griffith Company, of Los Angeles, for $410,000. Since the tunnel was the only available roadway through the pass, it had to be kept open during the excavation, and in order to do this, operations were begun from the top. Material was pushed over the edge of the cut by tractors with bull-

ANNOUNCING

A NEW AND FINER

MODEL F CLETRAC



CLETRAC MODEL F DIESEL 95 drawbar horsepower; 107.5 belt horsepower; also available with gasoline engine—94 drawbar horsepower; 110.93 belt horsepower

MORE THAN 95 HORSEPOWER

TWO YEARS and three months ago, Cletrac engineers began developing a bigger and better Model F Cletrac. Cletrac Model F had always done a good job—but users asked for more power, more speed; heavier, sturdier construction—streamlined design . . . a dozen new things in a tractor that would meet the ever-increasing demands of industry for heavy-duty work.

The new Cletrac Model F is an answer to these demands. Here is a tractor that has the capacity to handle the largest scrapers and wagons on construction jobs . . . maximum footage in lumbering . . . the heaviest trailbuilders, bulldozers and graders on road building work.

With four forward speeds, two reverse, and a high of five miles per hour, this new Model F reduces time on every trip . . . gives greater performance each day with larger production and lower costs.

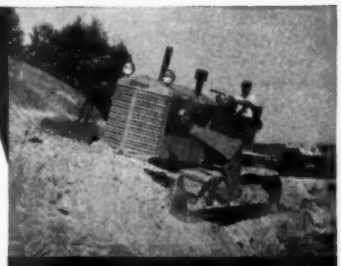
PROVED IN MANY MONTHS OF SERVICE

In announcing this new Cletrac Model F, we are able to bring you outstanding performance records because this tractor has been on the job and *proved in service for many months.* This is the first time a new, powerful tractor has been announced only after use and acceptance by many of the largest contractors in the country. These "on the job" tests have proved Cletrac Model F:

- ★ **Sturdier—it's built for tough conditions**
- ★ **Heavier—it provides more powerful traction**
- ★ **Faster—it handles more loads per day**
- ★ **More Powerful—it tackles bigger jobs**

Go over this Cletrac F with a fine tooth comb. Compare it feature by feature. Ask your Cletrac distributor to demonstrate it on your own jobs. You'll prove to yourself that Cletrac Model F will give you the performance, the capacity, the dependability that means lower costs, more profitable operations.

Cletrac Model F performs jobs like this



● Bulldozing at Reedsburg, Wisconsin. Contractor—Wm. Lathers, Jr.

● Operating a 20-yard scraper at Marten, Neb. Contractor—Morrison-Knudsen Co., Inc.

● As operated by the U. S. Bureau of Roads at Beltsville, Md.

The Cleveland Tractor Co., Cleveland, Ohio

Cletrac
Crawler Tractors
Built To Endure

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dozers. Shovels loaded it into Mack trucks, and it was transported to the fills on the new roadway.

The cut was 200 feet deep and 435 feet long, and carried down at a ½ to 1 slope. It involved the handling of some 250,000 yards of material, most of which could be handled with heavy equipment without blasting. However, as the excavation reached the lower levels, the east wall of the cut proved unstable, and a series of bad slides took place. The east slope was flattened to 1 to 1, which not proving adequate, was finally altered to 1½ to 1, in all adding the moving of about 200,000 extra yards of dirt.

There are 4 major fills on the new roadbed, the largest requiring about 100,000 yards of material. Earth for the fills is spread in 8-inch layers and compacted with rollers and sheepsfoot tampers. The compaction has averaged about 98%.

The new part of the highway will be a 48-foot plant mixed 3 lane pavement, and where the route follows the old alignment it will be 4 lanes, 2 concrete and 2 plant mixed, divided by a raised 4-foot concrete curb.

Most of the heavy power machinery on the job is fueled with butane, which the Griffith Company, one of the largest contracting firms in the west, has adopted for its equipment. Another interesting feature on the job is the field service greasing rig employed. This consists of a truck carrying grease, oils, pressure guns, air, and all necessary servicing equipment, which goes to the machinery in the field and eliminates the lost time usually required in bringing slow-moving pieces to the grease racks for servicing.

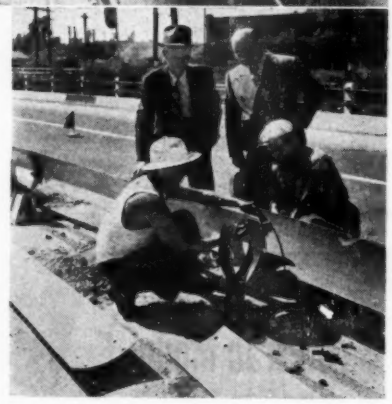
Rex Sawyer is Construction Manager for the Griffith Company, C. C. Bong is job superintendent, and E. L. Seitz Resident Engineer.

New Type Center Road Divider Used on Los Angeles Boulevard

Ramona Boulevard in Los Angeles, California, has recently been equipped with a new type center divider, the first installation of its kind in the world. This boulevard, leading out of the downtown area, is a four lane high speed artery with an accident record of 8 killed and 69 injured since it was opened three years ago. Most of the deaths and injuries were results of headon collisions, sideswiping and driving into bridge abutments.

Although a division of the roadway and the guarding of the center bridge abutments was indicated, the problem was complicated by other factors. Bounded on one side by railroad tracks and on the other by high hills, and with lanes narrower than those installed today, there was not space enough to provide a neutral zone without incuring excessive widening costs.

The separation was accomplished by taking two bumper type roadside guards and installing them back to back on



• Top: The high speed traffic is definitely separated so there will be no headon collisions or sideswiping by cars going in opposite directions. Below: Closeup of the bumper-type roadside guards being placed back to back.

one post. The rails are 12" widths of convex steel, fastened to spring steel brackets which hold them 5 inches apart at about hubcap height. To economize space a special heat treated steel post ¾"x4" with a tensile strength of 160,000 pounds per square inch was developed. Holes 12 inches square and 24 inches deep were made with air hammers and the posts, split at the bottom for better anchorage, were set in concrete. The rails were attached in 12-foot sections on straight stretches and 10-foot sections on curves. They are painted with alternate bands of black and white, and for better visibility at night the white bands on curves are coated with minute illuminating crystals to reflect headlight rays. On straight stretches regular aluminum paint was used. Electric cables have been installed inside the convex rail and Fresnel blinker lights are placed at 100-foot intervals.

The highway divider connects the center pillars of two bridges 3000 feet apart between which three S turns and blind curves make a particularly dangerous roadway. About 6000 feet of bumper rail was required.

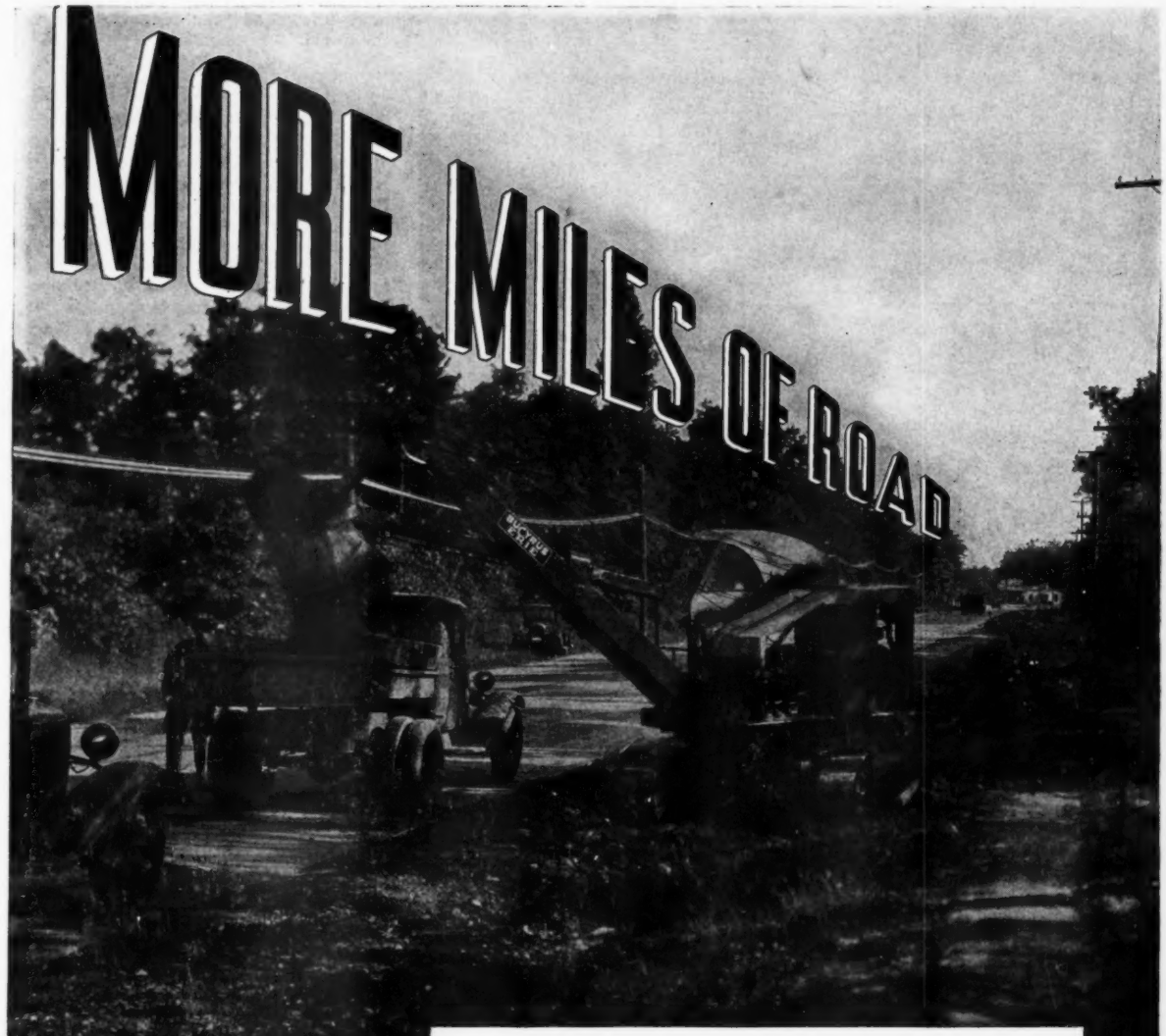
The new divider is designed and built by the United States Spring and Bumper Company, of Los Angeles. Although the bumper type guard has been successfully used for several years on the sides of roads, the present application of the principle as a central divider has never before been used. In the opinion of engineers who have inspected the installation, it represents a substantial step forward as a practical and economical safety measure.

Grand Coulee Enters 1939

January, 1939, found the concrete monolith of Grand Coulee ready for winter and for the work program between winter and the flood season when waters of the Columbia river will pass for the first time through the 20 submerged outlet conduits in the river channel. During 1938, the structure gained 25 feet in its climb to a final height-to-be of 550 feet. Its length was increased by 400 feet, bringing it to 3600 feet of the ultimate 4300.

More than 10,000,000 cubic yards of sand and gravel, taken out of the gravel pit about a mile and a half downstream are already in the dam. Day and night, electric shovels with buckets of 8-cubic yard capacity move the sand and gravel from the pit to belt conveyors. The pit yields a deposit that is 65 per cent sand and as only 28 per cent of the aggregate used can be sand, there is a mountain of several million yards of waste sand near the screening plant.

Toward the end of March, 1938, drilling began for the 5x7-foot tunnel 643 feet back into the east keyway, with final trimming completed in June. Rock excavation, by drilling, got under way in May for the foundation of the pump-



FOR ROADBUILDING and maintenance work, the peppy, hustling 10-B is the first choice of practical engineers, contractors and highway officials. Fast on-the-job moves are made with traveling speeds to 4¼ m.p.h. Fast job-to-job transportation is always available with a platform-type truck or with the special 10-B Trailer. The compactness and short clearance of the 10-B avoids traffic tie-ups and permits normal, high speed operation in narrow lanes and in tight spots. For more miles of road, and more economy in road work, investigate this world's fastest selling ⅜-yard excavator.

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BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

• This Bucyrus-Erie 37-B Shovel, powered by a Caterpillar Diesel engine, is being used on the construction of Stevens Pass Road in Central Washington.

ing plant and in April for the relocating of the huge mixing plants. In June, drilling for the first of an estimated 133,000 lineal feet of rock holes for pressure grouting the rock foundation of the dam began, and in July a big Leyner drill began work at the entrances for pumping plant discharge tunnels.

The year just gone saw six and a third million man-hours of labor by employees of the old contracting firm, MWAK, and the present contractors, Consolidated Builders Incorporated, together with the Bureau of Reclamation and sub-contractors. It produced 875,000 cubic yards of concrete.

About $4,000,000 was spent for materials for the project during the first 11 months of 1938, with 32 states sharing in the business. Washington led with $1,542,585.44 worth of business, and the next three were Alabama with $1,014,105.91, Illinois, with $388,829.66, and California with $280,299.33. These figures are from the United States Bureau of reclamation.

The new year finds a spectacular phase of the structure beginning and thousands of visitors are expected to view it during the coming summer. The waterfalls that tumble from the concrete channels left open as the foundations rise, will gain a new height each month and the huge lake that will be backed up 151 miles to the Canadian border is beginning to rise. This last opens a romantic chapter in the history of the Northwest, for the exodus of people from some 12 towns and thousands of farms is now underway. These villages, historically linked with the days of the fur traders along the Columbia, will be under water, some of them very soon.

The gigantic task of razing the buildings or removing them; of clearing all farm homes; of felling all timber in vast acres of virgin forest; of relocating more than a hundred miles of first-class highway; and rebuilding long stretches of railroad has begun. In other words, this vast stretch of territory is being stripped and scoured absolutely clean so that there will be nothing to harm boats that will sail on the lake of the future, or that will float down to injure the dam. This is a fascinating chapter in the building of the Grand Coulee-Columbia Basin project which is familiarly known as "the biggest thing in the world."

Yakima Ridge Canal Contract Awarded

A contract for construction of an additional 6-mile section of the Yakima Ridge Canal, Roza Division, Yakima Project, Washington, has been awarded to J. A. Terteling & Sons of Boise, Idaho. The successful bid of $448,335.70 was lowest of eight proposals received and opened by the Bureau of Reclamation.

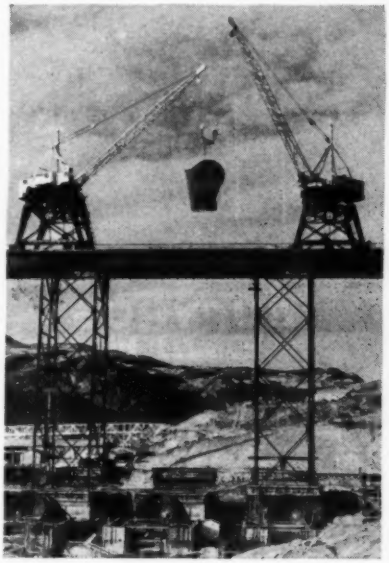
The contract, in addition to the excavation of this section of the canal, includes some concrete lining, the construction of two short tunnels, and a reinforced concrete siphon 13 feet in diameter and 1,400 feet long.

Social Security Board Replaces Million Account Number Cards

Approximately 1 million persons with old-age insurance accounts applied to the Social Security Board in 1938 for duplicate account number cards to replace those lost, destroyed, or so badly worn they could not be read, according to Peter Walraven, Manager of the Board's Field Office at Milwaukee, Wisconsin.

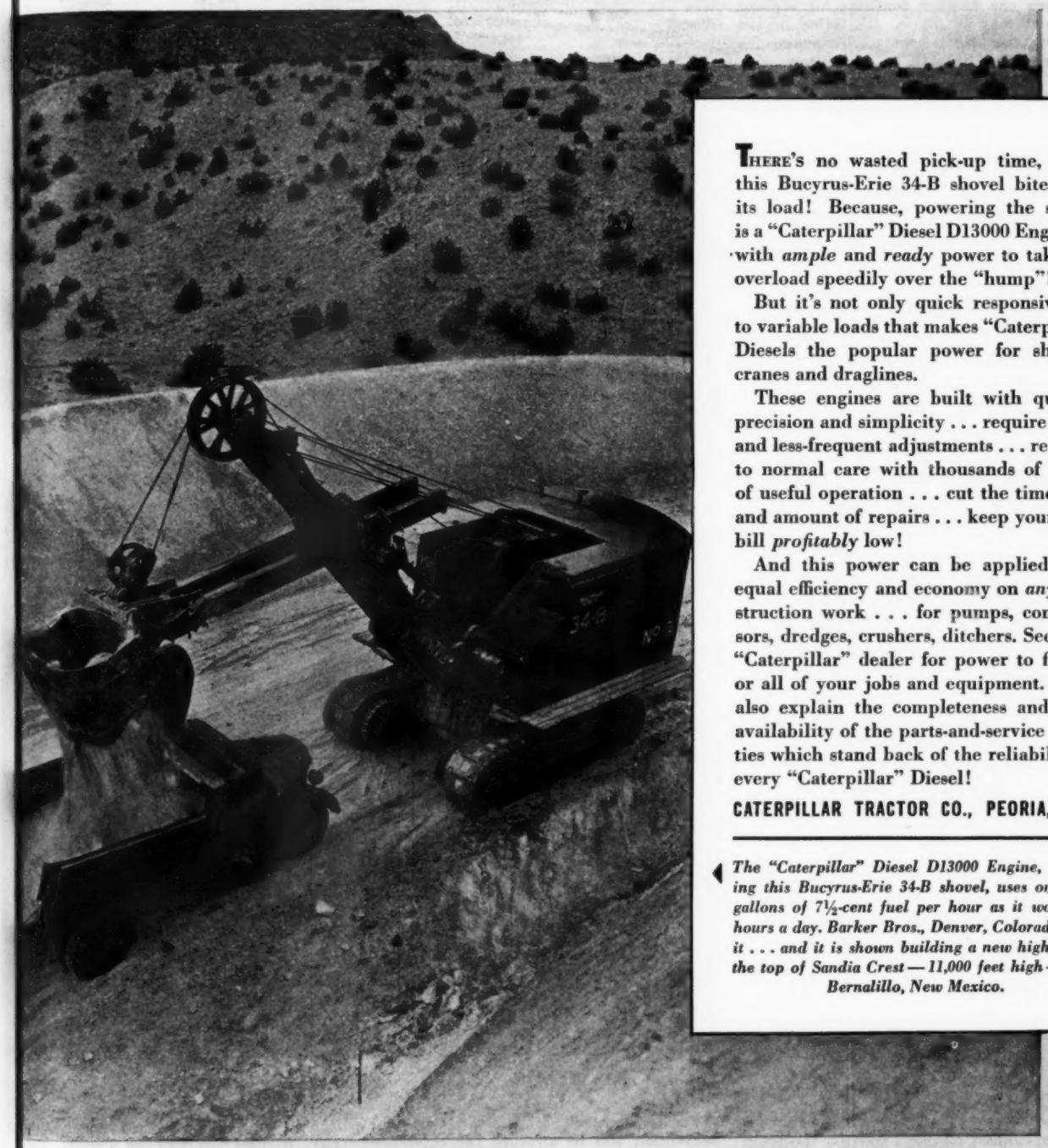
An increase in the number of such requests is anticipated during the coming years, said Mr. Walraven. He explained that the paper card now in use almost certainly will wear out some day and that with the passage of time the chances of its loss will naturally increase.

"Although requests for replacements are always granted," Mr. Walraven said, "the worker should understand that a little care on his part will help to prevent delay in issuing him a duplicate card. He should keep a permanent record of his account number, in any way he chooses. With such a record he



• Poised — just before it is lowered to become part of "the biggest thing on earth," Grand Coulee Dam.

IT ANSWERS THE LOAD WITH TIME-SAVING POWER!



THERE'S no wasted pick-up time, when this Bucyrus-Erie 34-B shovel bites into its load! Because, powering the shovel is a "Caterpillar" Diesel D13000 Engine—with *ample* and *ready* power to take the overload speedily over the "hump"!

But it's not only quick responsiveness to variable loads that makes "Caterpillar" Diesels the popular power for shovels, cranes and draglines.

These engines are built with quality, precision and simplicity . . . require fewer and less-frequent adjustments . . . respond to normal care with thousands of hours of useful operation . . . cut the time, cost and amount of repairs . . . keep your fuel-bill *profitably* low!

And this power can be applied with equal efficiency and economy on *any* construction work . . . for pumps, compressors, dredges, crushers, ditchers. See your "Caterpillar" dealer for power to fit any or all of your jobs and equipment. He'll also explain the completeness and wide availability of the parts-and-service facilities which stand back of the reliability of every "Caterpillar" Diesel!

CATERPILLAR TRACTOR CO., PEORIA, ILL.

The "Caterpillar" Diesel D13000 Engine, powering this Bucyrus-Erie 34-B shovel, uses only 3½ gallons of 7½-cent fuel per hour as it works 16 hours a day. Barker Bros., Denver, Colorado, own it . . . and it is shown building a new highway to the top of Sandia Crest — 11,000 feet high — near Bernalillo, New Mexico.

CATERPILLAR DIESEL POWER

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DIESEL ENGINES • TRACK-TYPE TRACTORS • ROAD MACHINERY

will be able to tell us what his number is, even if he loses his card. With the number, we can replace his card immediately. Without knowing what it is, we have to send his application for a duplicate to the accounting section of the Bureau of Old-Age Insurance at Baltimore, Md.

"In making such a request, the worker should be careful to explain that what he wants is a duplicate card, not a new one. Assignment of a new account number to a person who already has one number confuses his account and may result in difficulties in the eventual settlement of his claim for insurance benefits."

Apportion Highway Funds

Highway construction funds amounting to $135,000,000 have been apportioned to the states by the Secretary of Agriculture. Authorized by the Federal-Aid Highway Act of 1938, the money will be used for highway improvement and grade crossing elimination in the fiscal year beginning July 1, 1939.

The fund allotted to the federal-aid highway system, which includes extensions through cities, totals $100,000,000. Funds allocated for grade crossing elimination total $20,000,000 and the secondary or feeder road total is $15,000,000.

All the money will be spent through the state highway departments. Construction funds must be matched by the states but grade crossing money need not be matched.

The largest cut goes to Texas ($8,250,000) while New York is second high ($6,909,000) and Illinois is third ($6,580,000).

The District of Columbia, Delaware, Hawaii, New Hampshire, Rhode Island and Vermont were allocated $658,000 each to tie for the bottom position.

Federal Aid Allotments

State	Regular Federal Aid	Secondary or Feeder Roads	Grade Crossings	Total
Alabama	$2,068,493	$310,274	$393,552	$2,772,319
Arizona	1,423,400	213,510	125,461	1,762,371
Arkansas	1,702,583	255,387	343,731	2,301,701
California	3,793,823	569,073	728,856	5,091,752
Colorado	1,807,919	271,188	251,215	2,330,322
Connecticut	624,021	93,603	167,075	884,699
Delaware	487,500	73,125	97,500	658,125
Florida	1,335,020	200,253	277,471	1,812,744
Georgia	2,507,151	376,073	477,283	3,360,507
Idaho	1,223,119	183,468	161,779	1,568,366
Illinois	4,043,313	606,497	1,030,486	5,680,296
Indiana	2,425,913	363,887	506,736	3,296,536
Iowa	2,542,385	381,358	545,468	3,469,211
Kansas	2,585,837	387,876	504,959	3,478,672
Kentucky	1,824,345	273,652	356,846	2,454,843
Louisiana	1,436,747	215,512	310,856	1,963,115
Maine	873,455	131,018	135,191	1,139,664
Maryland	821,369	123,205	200,663	1,145,237
Massachusetts	1,375,489	206,323	408,286	1,990,098
Michigan	3,012,993	451,949	649,147	4,114,089
Minnesota	2,704,164	405,625	524,721	3,634,510
Mississippi	1,746,261	261,939	310,650	2,318,850
Missouri	2,986,426	447,964	596,184	4,030,574
Montana	2,032,384	304,858	261,252	2,598,494
Nebraska	2,044,283	306,642	347,689	2,698,614
Nevada	1,275,938	191,391	97,500	1,564,829
New Hampshire	487,500	73,125	97,500	658,125
New Jersey	1,321,366	198,205	389,614	1,909,185
New Mexico	1,595,294	239,294	166,957	2,001,545
New York	4,845,924	726,889	1,335,949	6,908,762
North Carolina	2,321,357	348,204	500,977	3,170,538
North Dakota	1,532,167	229,825	309,164	2,071,156
Ohio	3,583,189	537,478	833,853	4,954,520
Oklahoma	2,317,258	347,589	455,041	3,119,888
Oregon	1,638,823	245,823	224,953	2,109,599
Pennsylvania	4,221,088	633,163	1,128,616	5,982,867
Rhode Island	487,500	73,125	97,500	658,125
South Carolina	1,328,214	199,232	293,750	1,821,196
South Dakota	1,610,762	241,614	268,815	2,121,191
Tennessee	2,079,803	311,970	373,187	2,764,960
Texas	6,227,084	934,063	1,088,862	8,250,009
Utah	1,124,731	168,710	129,236	1,422,677
Vermont	487,500	73,125	97,500	658,125
Virginia	1,815,401	272,310	373,906	2,461,617
Washington	1,563,815	234,572	300,063	2,098,450
West Virginia	1,082,034	162,305	260,716	1,505,055
Wisconsin	2,413,315	361,997	486,074	3,261,386
Wyoming	1,249,044	187,357	132,134	1,568,535
Dist. of Col.	487,500	73,125	97,500	658,125
Hawaii	487,500	73,125	97,500	658,125
Puerto Rico	487,500	73,125	150,076	710,701
Adm. & Eng. Reserve	2,500,000	375,000	500,000	3,375,000
TOTAL	$100,000,000	$15,000,000	$20,000,000	$135,000,000

Annual Convention

The Association of Highway Officials of North Atlantic States will hold its Fifteenth Annual Convention at the Hotel Pennsylvania in New York City, February 15, 16 and 17.

The Program Committee has arranged for the presentation of a number of highly interesting topics, featuring "Safety" at the Wednesday afternoon session, February 16; "Design & Construction" at the Thursday morning session, February 17; and "Maintenance" at the Thursday afternoon session. The Friday morning session will be devoted to subjects of general interest.

Friday afternoon those attending the convention will be afforded the privilege of a preview of the World's Fair.

Marshall Ford Dam Three-Quarters Finished

Work on the first stage of Marshall Ford Dam, the major flood-control feature of the Colorado River project in Texas, is nearly three quarters completed, according to John C. Page, Commissioner of Reclamation.

Of the 1,089,000 cubic yards of concrete necessary to complete the low dam to its height of 190 feet above foundation, a total of 792,000 cubic yards, or 73 per cent, had been placed on December 1, 1938. Construction was begun with the award of the contract on December 3, 1936.

Marshall Ford Dam, 18 miles northwest of Austin, is at the upper end of the rich coastal plain stretching to the Gulf of Mexico. It is the plan that the dam will protect low lands subject to flooding from the erratic Colorado River, the flow of which has ranged from 13 cubic feet per second on one day in August 1918, to a momentary peak of 481,000 cubic feet per second during a flood in June, 1935.

Due to heavy rains in the upper valleys, the river again ran riot in July of this year, pouring two and one quarter million acre-feet of water over the half-

BECO Tiger Teeth are strong and tough . . . properly tapered for easy penetration in hard digging. These alloy-steel teeth can be reversed, resharpened, easily and quickly replaced. State your digging conditions . . . we can furnish teeth to meet your Bucyrus-Erie Excavator requirements. T3

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completed dam within a week. Concrete placing operations were delayed practically a full month as a result of this unusual flood. Despite the flood, the only serious one encountered since work began in February of 1937, construction is well ahead of schedule.

In May, 1938, the first 50-foot wide blocks of concrete reached the crest elevation 190 feet above the lowest foundation. Also in May, the river was diverted through two 26-foot diameter conduits formed through the concrete on the left side of the dam, allowing concrete to be placed in a continuous succession of blocks across the main river section.

Mr. E. A. Moritz, Construction Engineer of the Bureau of Reclamation explained that like Grand Coulee Dam, the Marshall Ford Dam is being constructed in two stages. The initial development consists of a concrete section 190 feet high and 2,300 feet long, and an earth embankment section 1,100 feet long on the left abutment. The ultimate development will increase the height of the concrete section 78 feet, the thickness 58 feet upstream, and will add approximately 750,000 cubic yards of concrete and 1,000,000 cubic yards of earth embankment.

The contract for construction, covering labor alone, will amount to approximately $7,000,000. When work is completed the Bureau of Reclamation will have expended, in addition to this sum, slightly less than $5,000,000 for construction materials. An average of 900 men, working 40 hours a week on a three-shift plan, have been employed by the contractor since work was begun.

• Senator Furgeson of Woodward, Oklahoma, and Major-General Schley, second in command of the U. S. Army Engineers, are shown here on the W. C. Cole & Morrison-Knudsen 48-B as the first dipper of dirt is removed at Fort Supply Dam in Oklahoma.

Funds for Roads on Public Lands

Secretary of Agriculture Wallace has apportioned to 15 public lands States the sum of $1,000,000 for the improvement of main roads through unappropriated or unreserved public lands, nontaxable Indian lands, or other Federal reservations other than forest reservations. The sum apportioned is authorized for the fiscal year beginning next July by the act of June 8, 1938. States participating in the apportionment are those having more than 5 percent of their area in lands of the above kind and the apportionment is on the basis of the area of such lands. It is not required that these funds be matched by the States. The apportionment is as follows:

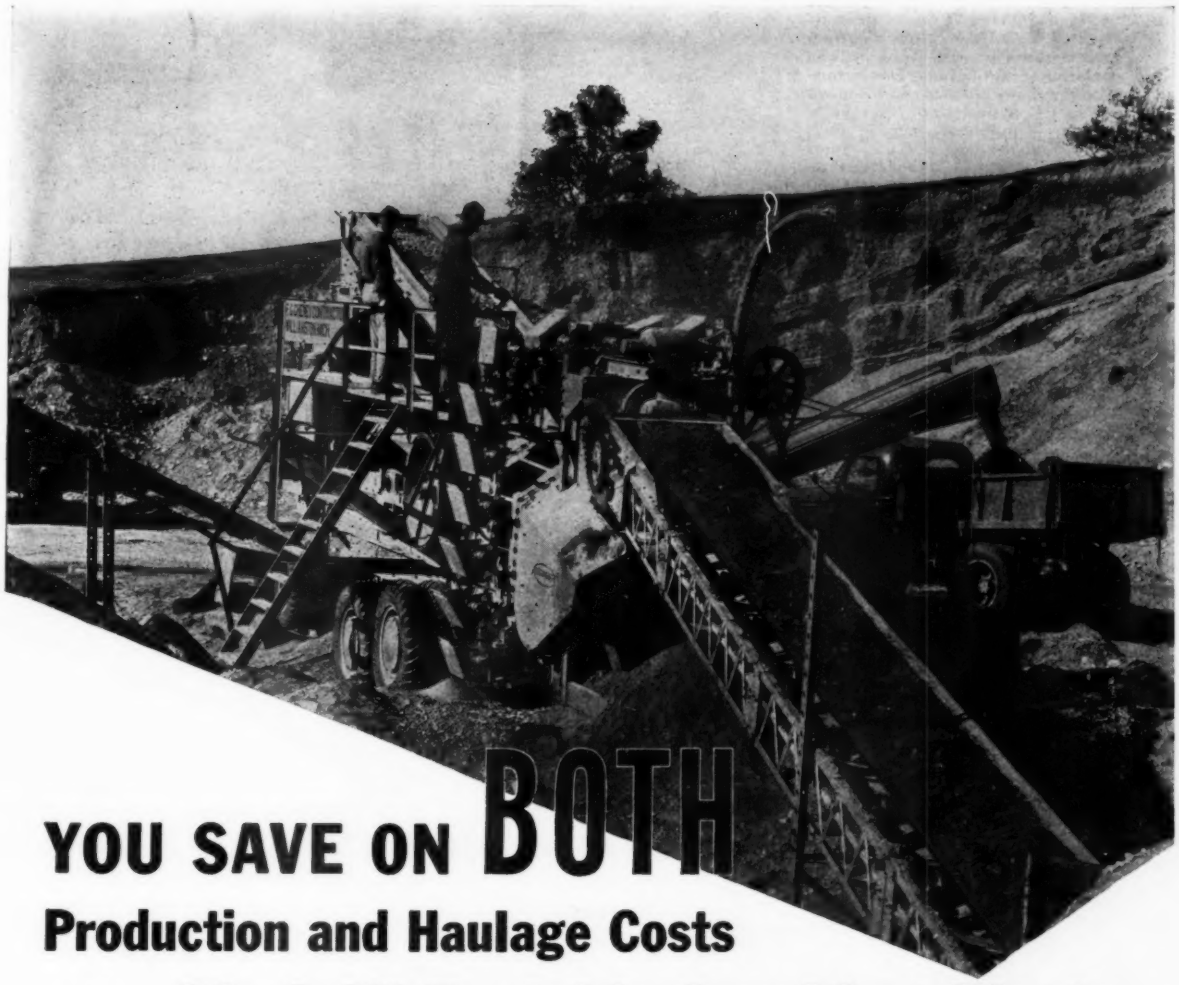
State	Sum apportioned
Arizona	$ 154,949
California	94,859
Colorado	37,837
Idaho	52,015
Montana	55,200
Nevada	212,442
New Mexico	84,982
North Dakota	12,925
Oklahoma	11,048
Oregon	60,542
South Dakota	19,763
Utah	108,843
Washington	14,512
Wyoming	80,083
Total	$1,000,000

• Haiss Model 27 Loader equipped with a 46 horsepower Waukesha motor owned by the Cia Estrados Modernas of Sao Paulo, Brazil. The loader is backfilling a ditch dug in a city street.

Snake River Project Nearing Completion

Storage of water behind Island Park Dam has begun. Completed last month, the dam on Henrys Fork of the Snake River in Idaho, is the first storage structure of a series of important engineering works being built to provide a supplemental and reliable irrigation supply for areas already developed along the Upper Snake River.

The project includes this dam, another storage dam known as Grassy Lake Dam, and the Cross Cut Diversion



YOU SAVE ON BOTH

Production and Haulage Costs

★ *with A-W Portable Crushing Plants*

Elimination of haulage is only one of the reasons why A-W Crushers deliver crushed stone and gravel at lowest cost per ton. Says Glen D. Kistler, President, Monmouth Stone Company, Monmouth, Illinois:

> "Our total power cost is about 8c per ton. Total production cost, including interest, depreciation, depletion and overhead (including office expense) is about 74c per ton. With our former set-up, production costs averaged about $1.05 per ton."

The experience of Monmouth Stone Company should be of especial interest to any producer. It shows that, under identical conditions, the modern, high-output A-W portable unit provided a saving of more than 25% over the equipment formerly used. Such a production record is no exception to the rule. It is made possible by deep, powerful jaws, operating at highest possible speed; oversize crusher shafts and roller bearings that insure freedom from breakdowns, increase capacity and reduce power cost. Write for full details and further proof of money-saving performance under all operating conditions.

The AUSTIN-WESTERN
ROAD MACHINERY CO., AURORA, ILL.

Motor Graders	Crushing and Screening Plants	Motor Sweepers	5-Yard Tractor-Scraper
Roll-A-Planes	Washing Plants	Shovels and Cranes	6-Yard Tractor-Scraper
Rollers	Blade Graders	Bituminous Distributors	8-Yard Tractor-Scraper
Snow Plows		Elevating Graders	12-Yard Hydraulic Scraper

For your convenience in writing to The Austin Western Road Machinery Co., you will find a card bound in this issue.

• M. L. O'Neil & Son were contractors on this new route cutting the distance between Spokane and Seattle, Washington. Three tandem units—12-yard LeTourneau scrapers pulled by Caterpillar tractors—and one single unit, moved an average of 6,000 yards of good dirt per 21-hour day on an average one-way haul of 1200 feet.

Dam and the Cross Cut Canal. The whole integrated plan is designed to provide a regulated water supply sufficient for the 120,000 acres now inadequately irrigated in the Fremont-Madison irrigation district. Previously, no storage facilities were available, the lands being forced to depend on the unregulated flow of various Snake River tributaries, with the result that serious late-season droughts frequently blighted crops.

Begun in 1935, the project is nearing completion, with Island Park Dam, the Cross Cut Dam and the Cross Cut Canal finished, and Grassy Lake Dam at present 61 per cent complete. Owing to severe winter weather, little can be done on Grassy Lake Dam between now and late spring, when the structure should be completed quickly.

This project was undertaken with an allotment of funds from the Public Works Administration. It is estimated to cost $2,500,000. Under a contract with the Fremont-Madison Irrigation District, with headquarters at St. Anthony, Idaho, the district has agreed to repay the cost of the project in 40 years without interest, as required under the Reclamation Law.

Island Park Dam, 85 feet high and 1,592 feet long, is a moistened embankment of clay, sand and gravel, with a protective layer of rock on its upstream face. Its reservoir, with a capacity of 126,600 acre-feet of water, eventually will be 10 miles long and 2½ miles wide. It has already caught about 15,000 acre-feet of water.

Grassy Lake Dam, of the same type, will be 120 feet high and 1,235 feet long. It will form a reservoir of 15,000 acre-foot capacity, and will regulate the flow of Grassy Creek. It is in Wyoming, east of Ashton 38 miles.

Cross Cut Dam is concrete, overflow type structure, 18½ feet high and 465 feet long. It serves to divert water from Henrys Fork about 50 miles below Island Park Dam into the Cross Cut Canal, 6½ miles long, which carries the water to the Teton River from which part of the irrigation district's lands are served.

This project will bring security to farmers in a wide area, and will serve to stabilize their production, thus vastly improving the economic conditions of a whole section of a State.

Mississippi River Flood Control Budget

Examination of Uncle Sam's new budget—about the size of a New York telephone directory—reveals that it contains a break-down of the $31,000,000 appropriation for Mississippi River flood control for the fiscal year beginning July 1, 1939. The proposed expenditures are as follows:

Overhead and contingencies	$ 2,386,397
Revetments	2,000,000
Main Line levees	4,516,183
Dredging	5,040,000
Rights-of-way (levees and flowage floodways)	330,000
Yazoo River	4,000,000
Salaries, Office of Chief of Engineers	70,420
Eudora Floodway	100,000
Morganza and Atchafalaya floodways	6,048,000
Atchafalaya River and Basin improvement	565,000
St. Francis River	2,380,000
White River backwater levee	1,500,000
Wax Lake Outlet and Charenton Canal	2,000,000
Total	$30,936,000

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Everywhere you look, There's a HAISS Bucket!
They're on the big jobs—the hard jobs—the jobs where ONLY THE BEST IN BUCKETS can sell itself. The Haiss is TOPS today. Wire, write or phone for prices and catalogs.
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FOR PAY LOAD
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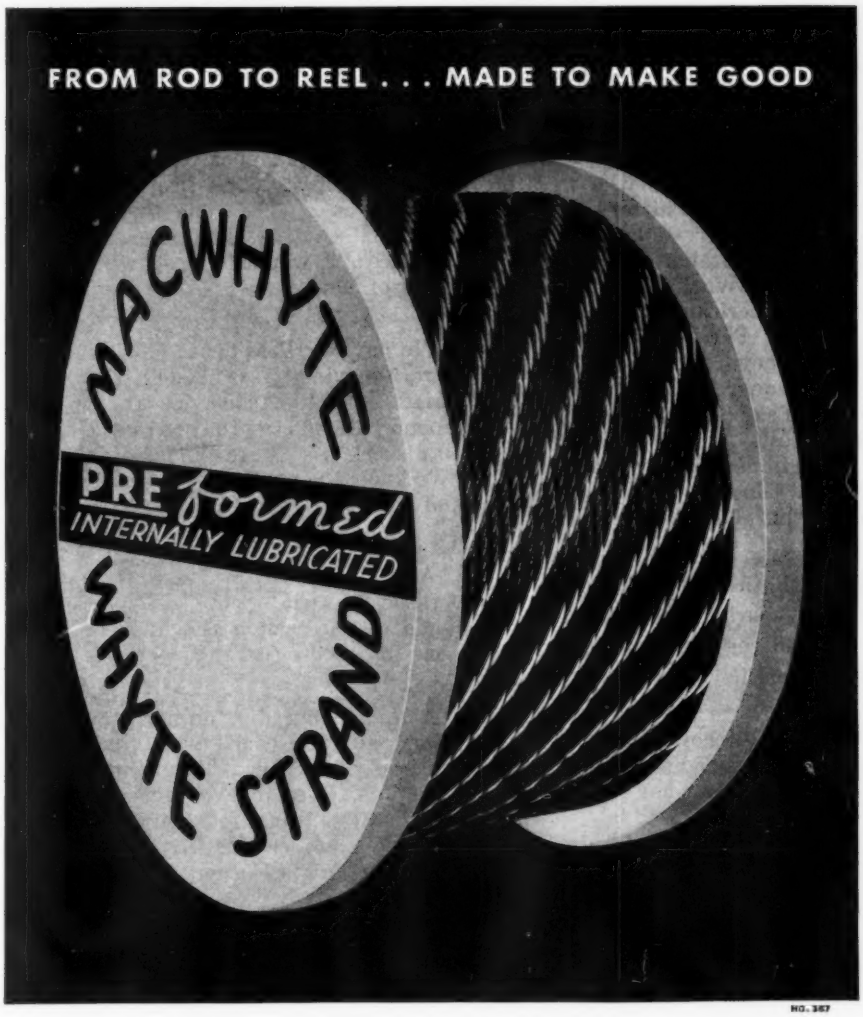
In stock at New York, Philadelphia, Baltimore, Atlanta, Hartford and Los Angeles.
GEORGE HAISS MFG. CO. INC., 144th ST. & PARK AVE., NEW YORK — DISTRIBUTORS EVERYWHERE

For your convenience in writing to George Haiss Mfg. Co., Inc., you will find a card bound in this issue.



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...which means that Macwhyte Wire Ropes, when given a "final OK" by the laboratory, are ready for dependable, economical service.

FIELD PROVED

...on all kinds of jobs, on all kinds of equipment, under all kinds of conditions. All year long, Macwhyte Engineers on the *job*, are constantly proving, improving, perfecting the *right* wire rope for *your* specific job.

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WIRE ROPE

MACWHYTE COMPANY · KENOSHA, WISCONSIN · Manufacturers of wire rope and braided wire rope slings . . New York . . Pittsburgh . . Chicago . . Ft. Worth . . Portland . . . Seattle . . San Francisco . . (Distributors throughout the U. S. A.)

For your convenience in writing to Macwhyte Company, you will find a card bound in this issue.

NOT in the *Contract*

A priest offered 25c to the boy who could tell him who was the greatest man in history.

"Christopher Columbus," answered the Italian boy.

"George Washington," answered the American lad.

"Saint Patrick," shouted the Jewish boy.

"The quarter is yours, but why did you say Saint Patrick?" asked the priest.

"Right down in my heart I knew it was Moses," said the Jewish boy, "but business is business."

Beneath this stone lies Murphy,
They buried him today;
He lived the life of Riley—
While Riley was away.

The small boy had fallen into the stream, but had been rescued. "How did you come to fall in?" inquired his rescuer.

"I didn't come to fall in," protested the boy, "I came to fish."

On one of the billboards featuring Smith Bros. Cough Drops the slogan reads: "Take one to bed with you." Under which some wag scrawled: "I wouldn't sleep with either of 'em!"

We pay our President 75,000 a year, a movie actress 480,000, the Chief Justice 20,000, a radio crooner 318,000, and a good cook 10 a week. As Oscar Wilde said: "We know the price of everything and the value of nothing."

A British writer says the Americans use poor English. Some of the Scotch they use is none too good either.

A Roustabout died on a rig in Illinois and the Tool Pusher telegraphed his widow: "Your husband, John, died today. Advise as to disposition." In a few hours the answer came. It read: "His disposition was mighty ornery."

'Tis the night before pay-day, and all through my jeans
I've hunted in vain for the ways and the means;
Not a quarter is stirring, not even a jit;
The kale is off duty, the greenbacks have quit;
Forward, turn forward, O Time, in thy flight,
And make it tomorrow, just for tonight!

Moe: "Wish I knew where I could get a job. I lost mine at the store, you know."

Joe: "You did? Why I thought you had been there so long you were a permanent fixture. How did it happen?"

Moe: "Oh, it was accidental. I simply moved a sign from a lady's lace dress to a bathtub without paying any attention to what I was doing."

Joe: "But that's nothing to get fired for. What did the sign say?"

Moe: "It said: 'How would you like to see your best girl in this for $5.95?' "

Shovel Operator: So your daughter is going around the world this summer alone. Is she prepared for the journey?

Contractor: Well, she can say "NO" in twelve languages!

"A nice sort of welcome!" said the father visiting his son at boarding school. "I am hardly out of the train when you ask me for money."

"Well, dad, you must admit the train was twenty minutes late."

Pity the modern girl. Everything she wants to do is either illegal, immoral, or fattening.

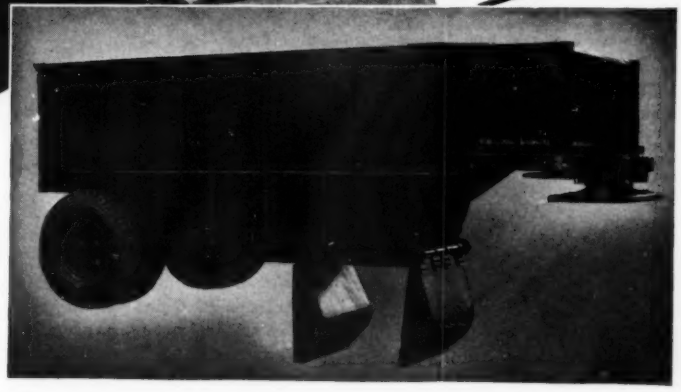
Newlywed Operator: "Do you mean to say there's only one course for dinner tonight? Just cheese?"

Wife: "Yes, dear. You see, when the chops caught fire and fell into the dessert I had to use the soup to put it out."

"How Did You Happen to Get Stuck In That Cement When You Knew It Was Wet In the First Place, Monihan?"

Can YOU Approach this Trailer TONNAGE ?

2700 Tons Hauled and Discharged in 7 hours with only FOUR 16-Ton (WATER LEVEL) S-D Automatic Bottom Discharge Trailers



This is the actual result of one company using S-D Automatic Trailers . . . the simplest, fastest, most fool-proof and economical trailer you can buy.

Are you operating full capacity? If not, isn't it even more important to save every dollar possible. Short operating schedules demand maximum production, minimum loss of time, and rock bottom maintenance cost.

Here is the trailer that eliminates all auxiliary powered dumping mechanisms—Result; simplicity and low upkeep expense! Sanford-Day's nationally known rail car principle of automatic bottom discharge is the feature of this trailer. Doors are tripped and closed automatically by the simple forward movement of the trailer. No manual labor whatsoever. With a continuous circuit of hauling—never stopping when discharging . . . with the maximum capacity available for given over-all dimensions . . . with doors swinging below top of bin when in discharge position, permitting a very low center of gravity and extreme low over-all height, S-D Automatic Bottom Discharge Trailers will save time . . . at production speeds you never thought possible.

Built for Strip Mines, Cement, Sand, Gravel, and other operations, in capacities to suit your individual requirements. Clip the convenient memo at right and mail NOW.

MR. SANFORD-DAY SAYS:

MAIL THIS MEMO NOW —

SANFORD-DAY IRON WKS. — Knoxville, Tenn.

Furnish us with your completely illustrated "Increase Production — Lower Cost" story on the S-D Automatic Bottom Discharge Trailer.

Firm.....

Address.....

City..... State.....

By..... Title.....

SANFORD-DAY IRON WORKS, 800 Dale Ave., Knoxville, Tenn., U.S.A.

MINE CARS, ALL TYPES • TRAILERS • WHEELS • SHEAVES

When writing to Sanford-Day Iron Works, please use coupon or card bound in this issue.

To Thoroughly Clean Safety Goggles

With constant usage, safety goggles will get dirty, just like any other article of wearing apparel. To protect those workmen whose skins may become irritated or infected by dirt or other foreign matter, American Optical Company suggests the goggles be thoroughly cleaned or sterilized at stated intervals. They recommend the following methods:

1. Wash the goggles in a hot solution of soap and water. Scrub the eyecups, lens rings and side screens with a stiff brush. If the goggles are spotted with paint or tar a ten minute soaking in a solution of varsol will clean the surfaces. Next, soak the goggles for thirty minutes in a 3 per cent cresol solution. Then they should be hung on a support to dry.

2. Wash the goggles in a hot solution of alcoholic green soap, rinse in warm water and hang to dry.

3. Simply immersing the goggles in boiling water for five minutes has been found to accomplish sterilization satisfactorily.

4. Soaking for ten minutes in a solution of formalin made by placing one part of 40 per cent formaldehyde solution in nine parts of water is another simple and practical method.

5. Scour the goggles to remove all dirt and then submit them to a five minute exposure of ultraviolet light. This is usually done in the first aid room or emergency hospital of the company where equipment for doing it is maintained.

6. Another method is subjection to sterilization by a moist atmosphere of antiseptic gas, preferably formaldehyde, for a period of ten minutes at room temperature.

FLEXIBILITY • • • TOUGHNESS • • • DURABILITY

• • • STRENGTH • • ELASTICITY • • •

Archimedes took no chances with his self-made block and tackle when he offered "To do the work of a hundred men" with it . . . because he had designed and constructed his equipment with a definite purpose . . . he had tested its ability, and consequently was sure what the results would be.

NEVER
A MATTER OF CHANCE

The quality of "HERCULES" (Red-Strand) Wire Rope begins with the fixed determination to produce a product that will be *consistently* long lasting . . . dependable . . . economical. It involves the use of acid open-hearth steel wire, correct design and manufacturing methods, long experience—all double-checked by rigid tests and exacting inspections from start to finish. The result is a wire rope that you can rely on—just as thousands of others are doing.

With wire rope, it pays to use the best, for therein is the way to increased safety, longer service and more continuous operation. You take no chance when you specify "HERCULES"—the wire rope that has proved its ability by its service record.

In order to be suitable for all purposes, "HERCULES" (Red-Strand) Wire Rope is made in a wide range of both Round Strand an Flattened Strand constructions—all of which are available in either the Standard or Preformed type.

"HERCULES" (Red-Strand) REG. U.S. PAT. OFF. WIRE ROPE

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS • ESTABLISHED 1857
5909 KENNERLY AVENUE • • ST. LOUIS, MO.

NEW YORK . . . . . 87 to 90 West St.
CHICAGO . . . 810 W. Washington Blvd.
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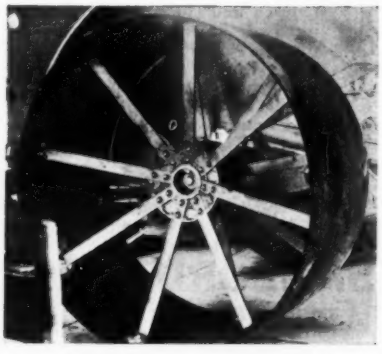
SAN FRANCISCO . . . . . 520 4th St.
SEATTLE . . . . . 3410 First Ave., South.

• A Denver contractor uses a tractor equipped with broad, all metal, wheels. When moving the wheels are as shown here. On location they are poured full of concrete and the tractor becomes a very serviceable roller. After the job is completed the concrete is broken out to lighten the tractor for the road.



When writing to A. Leschen & Sons Rope Co., please use coupon or card bound in this issue.

A Money Saving Accessories

Handy Hoist

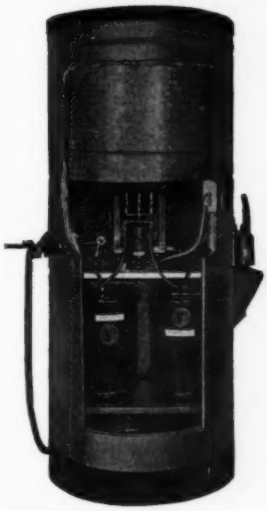
Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool — easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes — ¾ ton, 1½ ton, 3 ton, 4½ ton, and 6 ton. Write for descriptive literature.

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough—that's why replacements and adjustments are less frequent.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.



New Bucyrus Oil Reclaimer

With the NEW Bucyrus Oil Reclaimer, used oil is reclaimed by a simple washing and filtering process at an average cost of about nine cents per gallon. It is a scientific fact, arrived at by leading research engineers and chemists throughout the country, that engine-use breaks down only the weaker and unstable molecules of your oil. These constitute about 10 per cent of the oil—the other 90 per cent, the strongest particles of the original oil, can be separated and cleaned for re-use by the NEW Bucyrus Oil Reclaimer.

Investigate the possibilities of the Bucyrus Oil Reclaimer before you discard another quart of used oil.

Wire Rope

Selected by the men who build your excavating and drilling machinery, Bucyrus-Erie rope has the special features that spell better performance. B-E wire rope has a uniform high quality, and comes in the right sizes, types, and construction for your exact needs. Send for wire rope bulletin.

Push-Pull Jack

No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. The drop-forged nuts, lever socket, ratchet and screw are heat-treated so that a welding heat will not damage the jack. Screw lengths — 10", 12", 14", 16", and 18". Capacity 35,000 lbs. Send for bulletin.

T 13

BUCYRUS - ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Equipment You Ought to Know About

(*Continued from page 93*)

These Generating Plants are powered by two cylinder, four cycle engines operating at 1800 RPM with sufficient power output to produce 25 percent more than their rated capacity. The generator frame is of rolled steel and the generator produces 110 volt 60 cycle AC service, with voltage and frequency very closely regulated. The generators and engines are completely radio shielded to prevent interference in transmitters or receivers.

The generator also produces 12 volt direct current for recharging the starting battery at an adjustable rate up to 150 watts, making it possible to use a 12 volt storage battery for emergency lighting, or as a source of power to operate radios. Thus, a limited amount of electric service is available, even when the plate is not operating.

The complete bulletin fully describing these models will be sent to readers directly by the manufacturer.

Skullgard and Shield

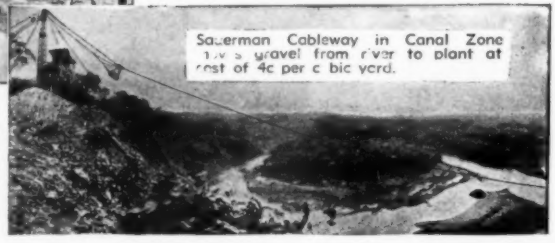
Head protection and welding safety are simultaneously provided in this latest development of the Mine Safety Appliances Company—The MSA Combination Skullgard and Welding Shield. The Skullgard may easily and quickly be detached from the shield and worn separately for other work when desired. Descriptive bulletins may be had upon request to the Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh, Pennsylvania.

New Line of Rex Mixers

The Chain Belt Company of Milwaukee announces a complete new line of Rex concrete mixers in the 3½-S, 5-S, 7-S, and 10-S sizes. The Rex 5-S is made in a two wheel end discharge and a four wheel side discharge style and is powered by a 6 h.p. single cylinder air cooled engine. The 7-S is made in a two wheel end and four wheel side discharge model and has the optional power of one cylinder air cooled or a four cylinder air cooled engine. The Rex 10-S mixer is made in a two wheel end discharge, four wheel end discharge, and a four wheel side discharge model powered by the standard or heavy duty four cylinder engine. All these mixers can be furnished with steel, solid rubber, or pneumatic tired wheels. All can be equipped with the new Rex Batch Meter and the new Rex self-priming centrifugal water pump. These new 1939 Rex mixers are streamlined for fresh modern appearance and are painted bright Persian Orange for better prolonged appearance in the field.

Sauerman Scraper moves 40,000 cu. yd. of sludge from one storage pile to another 1150 ft. away at rate of 700 cu. yd. per day.

Sauerman Tower Machine digs a basin 1250 ft. long, 360 ft. wide and 30 ft. deep for sewage treatment plant near Paris, France. The bucket runs up a ramp hinged to the front of the tower and drops the material into a car-loading hopper.



Sauerman Cableway in Canal Zone moves gravel from river to plant at cost of 4c per cubic yard.

CUT YOUR COSTS

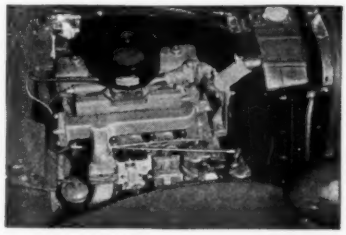
FOR larger profits on long range excavating and material handling work, use a Sauerman Drag Scraper, Slackline, or Tower Machine. A Sauerman machine is able to span an area 1,000 ft. or more in width and convey materials from any point in this area at a rapid rate. One man handles the entire operation.

Many different jobs—large and small—where materials have been dug, hauled and placed for a few cents per cubic yard are illustrated in the Sauerman Catalog. Write for this book.

SAUERMAN BROS., Inc.
474 S. Clinton St., Chicago

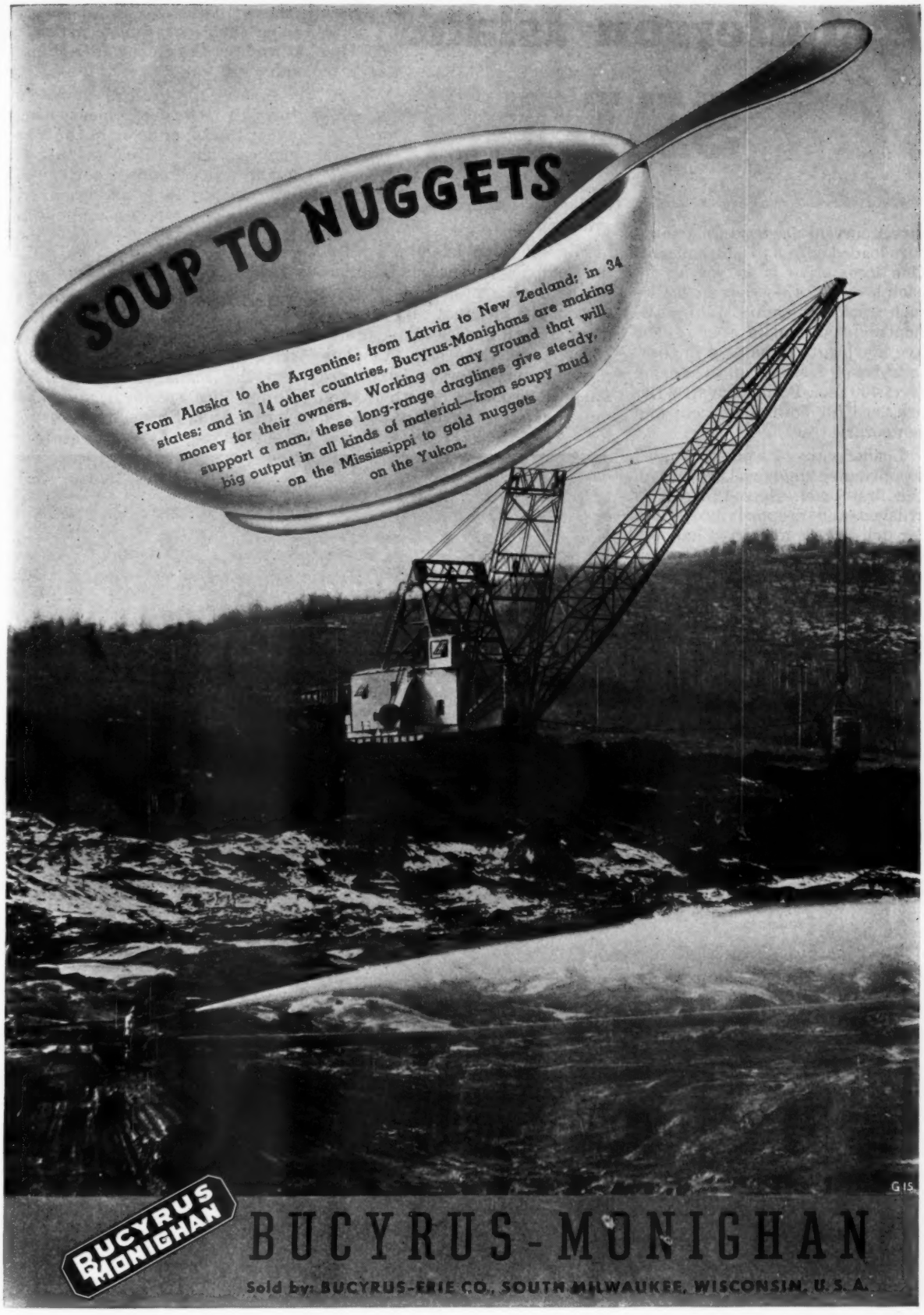
Diesel for Ford

The Buda Company, Harvey, Illinois, manufacturers of lightweight, high-speed diesel engines for trucks and buses, have announced one of their standard production models for installation in Ford truck chassis.



The engine used is a four cycle, four cylinder, solid injection Buda-Lanova Diesel, Model 4-DT-212, with 3⅝" bore by 5⅛" stroke, having a 212 cubic inch displacement. This model, like all of the other 9 models of Buda Diesel truck and bus engines, incorporates the Lanova Combustion System.

For your convenience in writing to Sauerman Bros., Inc., you will find a card bound in this issue.


SOUP TO NUGGETS
From Alaska to the Argentine; from Latvia to New Zealand; in 34 states; and in 14 other countries, Bucyrus-Monighans are making money for their owners. Working on any ground that will support a man, these long-range draglines give steady, big output in all kinds of material—from soupy mud on the Mississippi to gold nuggets on the Yukon.
BUCYRUS MONIGHAN
BUCYRUS-MONIGHAN
Sold by: BUCYRUS-ERIE CO., SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Jefferson Island SALT

(Continued from page 85)

direct current are used for pulling cars loaded with 5 to 6 tons of salt. One locomotive is in service on each level and they operate on 36-inch tracks which are laid permanently in the main rooms. The average length of haul on the first level is 700 feet and on the second level 400 feet. Bethlehem steel ties are used for both permanent and temporary trackage.

Loaded cars of salt are hauled to a primary single-roll crusher on the first level. Here the salt is crushed and dropped into a bin for delivery to an Allis-Chalmers two-drum balanced hoist which transports it to the tipple in the mill building on the surface.

Due to the high purity of Jefferson Island rock salt no refining is necessary and crushed salt hoisted from the mine is fed directly to Hummer electrically-vibrated screens for grading into the various coarse sizes of rock salt demanded by consumers. After screening, the various grades are stored in huge bins, and drawn from these bins into sacks or loaded as bulk salt into cars.

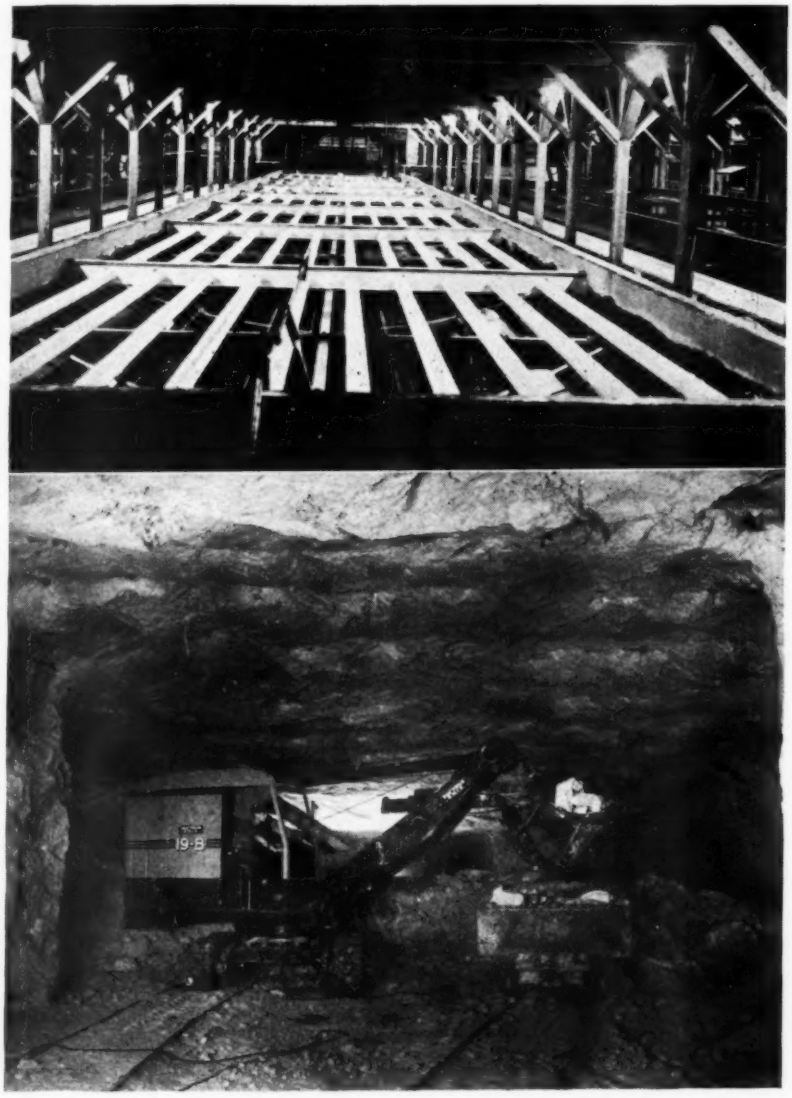
All Shipments Are Finished Products

Finer grades of rock salt are made by reducing the coarse rock salt by running it through roller mills of the Nordyke Mormon type. Waste salt in the form of dust is made into brine and subsequently evaporated into a high grade product.

The Jefferson Island Salt Mining Company's operation is unique in the southern salt industry in view of the fact that they are producers of all grades of rock, evaporated and flake salt. All shipments from Jefferson Island are finished products whether they are packed in cartons, pockets, bags or barrels or are shipped in bulk. Their most famous article is, of course, the Hexagon Carton of table salt.

A safety program is carried out through the department heads under the supervision of the management. The entire personnel has qualified one hundred per cent in first aid training and each employer has a certificate issued by the Bureau of Mines.

J. L. Bayless, Jr., is President of Jefferson Island Salt Mining Company with headquarters at the main office in Louisville, Kentucky. The mine and plant at Jefferson Island, Louisiana, are under the management of J. C. Gordy, Vice President, and W. H. Gordy, Mine Superintendent.



• Top: Inside the grainer plant where the pure brine is boiled in these open pans which are 125 feet long. From here it is pumped to the filters, kiln-dried, screened and packed. Bottom: Loading salt from the 14-foot entries on the second level presented a problem until a Bucyrus-Erie short-coupled mucker was put on the job. This electrically operated shovel is equipped with a special 10-foot boom for working in close quarters and uses a ⅝-yard dipper.

You can get TWICE the Production WITH 1/4 YOUR PRESENT TRUCKS

You can eliminate 75 per cent of your heavy investment in trucks with the Brooks Load-Lugger, wherever loading is done by hand. Decrease truck operating costs . . . eliminate wasted standing idle time. ONE Load-Lugger and 4 to 8 Load-Lugger Buckets can do the work of a number of trucks . . . with far greater production and at much less cost. Write for the complete cost-cutting story. Demonstrations arranged in most sections.

BROOKS EQUIPMENT & MFG. CO.
80 Davenport Road, Knoxville, Tennessee.

ROEBLING
The pacemaker in wire rope development

WIRE · Wire Rope · Welding Wire · Flat Wire · Bare and Insulated Wires and Cables · Wire Netting and Cloth. John A. Roebling's Sons Co., Trenton, New Jersey.
Branches in Principal Cities

Right Down to Fighting Weight

You want more than dead weight in a bucket to lick a tough digging job. You want speed—agility! Williams design, welded construction, and special alloys insure stamina and ruggedness, without excessive weight. Williams Buckets carry plenty of weight, but they carry it in the right places and in the right proportions. You move more materials in less time with Williams Buckets—and that's profitable.

. . . and if that's what you want in a bucket, you'll find your particular type in the Williams Catalog. It's free!

THE WELLMAN ENGINEERING CO.
7002 CENTRAL AVENUE • CLEVELAND, OHIO

Distributors located in all parts of the country represent the Williams Line of Power-Arm, Multiple Rope, Power-Wheel, Single Line, Hook-On and Dragline Buckets.

Send for Catalog

WILLIAMS *Buckets*
built by WELLMAN
BUILT TO LAST . . . AND MOVE DIRT FAST!

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Book reviews

A handbook of ready reference of authoritative information from all states in the union on the regulations covering the size and weight restrictions of Truck and Trailer Size and Weight Restrictions for 1939 is offered free of charge to any person who sends a request to the Four Wheel Drive Auto Company at Clintonville, Wisconsin.

The Armco Culvert Manufacturers Association of Middletown, Ohio, announce their new bulletin on ARMCO Bin-Type Retaining Walls. Dimensions and suggested designs are given on a large legible chart on pages 8-9 of this 16-page bulletin. Your copy can be had by writing to the manufacturer at Middletown.

The Second edition of the Engineer's Manual by Hudson is now completed. This manual originated from the conception that the practising engineer would welcome a consolidation of the formulas and constants which appear to be most useful in a systematic order and in a pocket size book. Each formula is preceded by a statement in which its application, the symbology of the involved physical quantities and definite units of measurement are indicated. The sequence of the formulas is based generally upon their order of derivation so that the understanding of a formula may be enlarged by inspection of the formulas which precede it. A copy may be had for $2.75 by writing to John Wiley & Sons, Inc., 440 Fourth Avenue, New York, New York.

The 1939 edition of Kempe's Engineer's Year-Book is now on the market. Since the first edition appeared forty-five years ago, each year has brought increasing revisions and additions in order to keep the book up to date with current practice, and the 1939 edition—the 45th—contains 2,824 pages giving in concise form the particulars, formulas and tables so often required by engineers engaged in all branches of industry. Mining, explosives, civil and similar branches are thoroughly represented. This book can be had from the Morgan Brothers (Publishers), Ltd., 28 Essex Street, Strand, London, W. C. 2, for approximately $8.25 (31s.6d. net).

The Cleveland Tractor Company of Cleveland, Ohio, announces the publication of a 35-page booklet showing the features of design of Cletrac Crawler Tractors. Each component part of the tractor has been "spot-lighted" and the elements of each group illustrated and analyzed from engine to drawbar. Interested readers will be supplied copies upon request.

"How to Make Cable Joints—Portable Cable" is the subject of a new 16-page booklet issued by the General Electric Company. It gives detailed instructions for splicing and vulcanizing all the principal types of rubber-insulated rubber-jacketed portable cables. These should be sufficient for almost every installation, whether on mining machinery, shovel, dredge, or other portable electric equipment. Copies of this booklet are available on request. The publication number is GEA—2989.

The New Third Edition of Photography Principles and Practise, written by C. B. Neblette and published by D. Van Nostrand Company, Inc., has recently been released. This book contains full practical directions covering every type of photographic work and equipment—cameras, lenses, emulsions, development, printing and toning. The new methods and most recent advances range over the entire field of photographic practice. Charts, diagrams, photographs, formulas, as well as complete descriptions, make clear all details of technique and all pertinent principles. A copy can be had for $6.50 by writing to the publishers at 250 Fourth Avenue, New York, New York.

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(taken from page 123)

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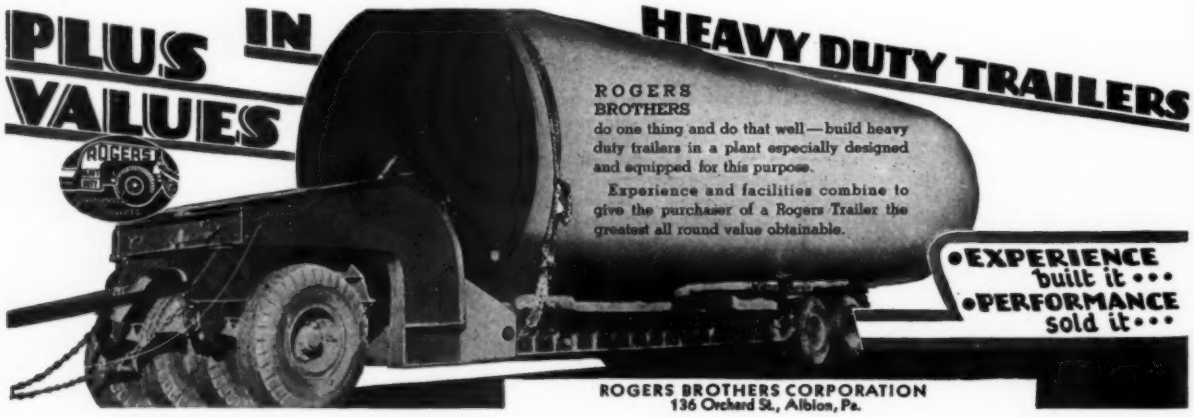
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Trade notes

Effective November 1, 1938, the Sterling Motors Corporation of Milwaukee, Wisconsin, acquired the assets of the truck division of the Fageol Truck & Coach Company of Oakland, California. A Sterling factory branch will be opened at 470 Bayshore Boulevard, San Francisco, on or about February 1st to serve both Sterling and Fageol owners in Northern California and the Pacific Northwest. For the time being, sales and service are handled from the Fageol factory at Oakland.

The Bucyrus-Erie Company, builders of all sizes and types of excavating machinery, have just closed with the Gulf Tractor & Equipment Company of Houston, Texas, to represent them in that territory where they will handle shovels, draglines and buckets, clamshells, lifting cranes and drag shovels from the ⅜-yard to 2-yard sizes.

Announcement of the opening of a new branch office and warehouse in Seattle has been made by the Macwhyte Company, whose plant and home offices are located in Kenosha, Wisconsin. H. A. Kamp, well known to northwest wire men, will have charge of the new office, according to W. J. Brett, Northwest Manager for Macwhyte. Complete lines of wire rope for logging, contractor, and industrial use will be stocked at all times.

Neil C. Hurley, Jr., was elected a Vice President of the Independent Pneumatic Tool Company at a special meeting of the board of directors January 10. Mr. Hurley has been secretary of the company for the past four years.

The friendship existing between Father Kelly and Rabbi Levi is proof against differences in race and religion. Each is distinguished for his learning, his eloquence and his wit; and they delight in chaffing each other. They were seated opposite each other at a banquet where some delicious roast ham was served and Father Kelly made comments upon its flavor. Presently he leaned forward and in a voice that carried far, he addressed his friend:

"Rabbi Levi, when are you going to become liberal enough to eat ham?"

"At your wedding, Father Kelly," retorted the rabbi.

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BUCYRUS-ERIE 16-B Gas Shovel, Dragline and Clamshell. ⅝-yd. Shovel dipper. 35' Clamshell—Dragline boom. Winch head. Electric starter. Waukesha 6-cylinder 4"x4¾" engine. Very good condition. Located North Carolina. Box 2226-SS.

⅝-YARD

BUCYRUS-ERIE 19-B Gas. ⅝-yd. Positive Rope Crowd Shovel. Electric starter. Wisconsin Model L-4 6-cylinder engine. Located near Boston. Box 2227-SS.

BUCYRUS-ERIE TYPE AA ⅝-yard Air Tunnel shovel cat. mounted. Two speeds. Will work in 14' clearance. Reconditioned. Excellent condition. Located New York. Box 2180-SS.

BYERS MODEL 128. ⅝-yd. gas shovel and 35' boom dragline, including ½-yd. Page "C" drag bucket. 4-cylinder Diamond T engine. Engine overhauled 1937. Good operating condition. Located Illinois. Box 2087-SS.

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BUCYRUS-ERIE B-2. Extra High Lift shovel. 21'3" boom. 18'4" dipper handle. ⅞-yard dipper. Well cared for. Good condition. Located Rhode Island. Box 2047-SS.

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BUCYRUS-ERIE — B-2 — HIGH LIFT STEAM shovel. 21'3" boom, 16' dipper handle, ⅞-yard dipper. Single shaft caterpillar. Located Vermont. Box 1135-SS.

1-YARD

BUCYRUS-ERIE 32-B—Gasoline chain crowd 1-yard shovel. Electric starter. Single shaft cats. Wisconsin 6-cylinder 5"x6" engine. Few minor repairs needed. Otherwise excellent condition. Located near Boston. Box 2061-SS.

BUCYRUS-ERIE — D-2 1 yard Diesel Shovel. Atlas engine. Field reconditioned. Located North Carolina. Box 1079-SS.

BUCYRUS-ERIE 1030 — ELECTRIC TUNNEL shovel. Boom 10 ft. 7 in. Dipper handle 10 ft. 5 in. 1-yd. dipper. Boom hoist 5 ft. 5 in. rear end clearance. 2 motor—power supply 3 phase, 60 cycle, 440 volt. Located Virginia. Box 1068-SS.

BUCYRUS-ERIE—31-B STEAM SHOVEL. 22' boom, 15' dipper handle, 1-yard dipper. Now operating, can be demonstrated. Located Alabama. Box 1130-SS.

MARION MODEL 7, 1-yard steam shovel. Has not operated in the past five years. New flues recently installed in boiler. Located Buffalo, New York. Box 2006-SS.

NORTHWEST—Model 105. 40' boom clamshell and dragline including 1-yard Williams clamshell bucket. Also 1-yard shovel equipment. Field reconditioned summer 1938. Good operating condition. Located Wisconsin. Box 2245-SS.

P&H MODEL 600 1-yd. Gasoline shovel. Waukesha engine. Crane equipment also available. Good condition. Located Connecticut. Box 2113-SS

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SMALL SHOVELS
Under 2 Yards continued

1¼-YARD

BUCYRUS-ERIE 33-B—1¼-yard gas shovel — chain crowd. One year old. Located Northern Minnesota. Box 2213-SS.

BUCYRUS-ERIE GA-2—Gas-Air Extra High Lift Shovel. Waukesha 4-cylinder 6¼"x8". engine. Factory rebuilt since originally shipped. Good operating condition. Located near Boston. Box 2228-SS.

BUCYRUS-ERIE GA-3 Gas-Air 1¼ yard shovel. Single shaft cat. Electric starter. Waukesha 4-cylinder 6¼"x8" engine. First class condition. Located near St. Louis. Box 2162-SS.

BUCYRUS-ERIE GA-3 Gas-Air 1¼-yd. shovel. Waukesha 4-cylinder 6¾"x8" engine. Good operating condition. Now operating Arizona. Box 2090-SS.

BUCYRUS-ERIE. GA-2, Gas-Air. 1¼-yard shovel. Electric starter. Waukesha W.L. 4-cylinder 6¼"x8" engine. Single shaft cat. Extensively repaired recently. Located Texas. Box 2030-SS.

2—BUCYRUS-ERIE E-2 shovels and draglines. 1½-yard Plate dipper. 45' boom plus 10' extension. 1¼-yard Page drag bucket. Electric light plant. Atlas Diesel engines. Engines overhauled since last used. Balance of machines good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SS.

TWO—BUCYRUS-ERIE—GA-3, GAS-AIR 1¼-yard shovels. Wisconsin D-2—6 cyl. 5¼"x6½" engines. Good condition. St. Paul, Minnesota. Box 1097-SS.

BUCYRUS-ERIE 41-B — 1¼-YARD STEAM SHOVEL. Located near Boston. Electric light plant. Very good price. Box 1096-SS.

BUCYRUS-ERIE—41-B—STEAM SHOVEL. 21' boom, 15' dipper handle, 1¼-cubic yard dipper. Now operating. Will demonstrate. Located Alabama. Box 1131-SS.

BUCYRUS-ERIE GA-3—Gas-Air 1¼-yard high lift shovel and 45' boom clamshell machine. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SS.

LIMA MODEL 101. 1¼-yard gas shovel. 50' boom dragline. Excellent condition. Located Texas. Box 2029-SS.

2—LIMA MODEL 101. 1¼-yard gasoline shovels. 26' boom, 17' dipper handle. Waukesha Model J. K. 6½"x7" engine. Recently rebuilt. Excellent condition. Located Texas. Box 2042-SS.

2 MARION Model 450—Steam Shovels. Good condition. Located Connecticut. Box 1154-SS.

MARION MODEL 32—1¼-yd. steam shovel. Boiler inspected February 1, 1938. Machine in good condition. Located Eastern Pennsylvania. Box 2161-SS.

1½-YARD

KOEHRING—Model 601. 1½ yd. Shovel and 55' Boom Clamshell and Dragline. Operating condition. Located Wisconsin. Box 2244-SS.

P&H MODEL 700-B. 1½-yd. Gasoline shovel. Waukesha engine. Good condition. Located Connecticut. Box 2114-SS.

1¾-YARD

BUCYRUS-ERIE 43-B late model 1¾-yd. chain crowd shovel. Electric starter. 1½ K.W. Kohler light plant. Buda-Lanova 6-cylinder 5¼"x7" Diesel engine. Located Central New York State. Excellent condition. Box 2019-SS.

BUCYRUS-ERIE—43-B Gasoline 1¾ yd. Chain Crowd Shovel. Good operating condition. Located Massachusetts. Box 2246-SS.

MARION—MODEL 480 High Lift Steam Shovel. Very good condition. Ready to go to work. Located Minnesota. Box 2215-SS

5—MARION MODEL 37, 1¾-yard steam shovels, steel cab. Good working condition. Located Minnesota. Box 2153-SS.

2-YARD

MARION MODEL 480—2-yd. Steam shovel. Vertical boiler. Boiler inspected February 1, 1938. Excellent condition. Located Eastern Pennsylvania. Box 2102-SS.

NORTHWEST—MODEL 80—2-yard gas shovel. Twin City 8"x9" engine. Actually used about 20 months. Since fully repaired except dipper. Excellent condition. Located State of Washington. Box 2214-SS.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING engineer
South Milwaukee, Wis.

SMALL DRAGLINES
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B Gas Dragline, 28' Boom. ⅜-yd. AU Drag bucket. Battery lights and electric starter. 14" cat treads. Field reconditioned. Located Texas. Box 2219-SD.

½-YARD

AUSTIN-WESTERN — ½-Yd. dragline and shovel. ½-Yd. Page drag bucket. Dragline equipment practically new. Very good condition. Located Wyoming. Box 2224-SD.

BUCYRUS-ERIE 16-B Gas dragline, clamshell and shovel. 35' Dragline—Clamshell boom. ⅝-Yd. shovel dipper. Winch head. Electric starter. Waukesha 6-cylinder 4"x4¾" engine. Very good condition. Located North Carolina. Box 2226-SD.

UNIVERSAL—Gas ½-yd. Shovel and 35' Boom Dragline on Thew Style caterpillar mounting. Distributor frame for truck mounting also included. Fair working condition. Located near Chicago. Box 2233-SD.

⅝-YARD

BYERS MODEL 128. ⅝-yd. Gas dragline 35' boom including ½-yd. Page "C" drag bucket. 4-cylinder Diamond T engine. Engine overhauled 1937. Good operating condition. Located Illinois. Box 2087-SD.

NORTEWEST MODEL 2, 40' boom dragline—Page ⅝-yard R. C. dragbucket. Kohler light plant. Wisconsin 4-cylinder 5¼"x6½" engine. Very good operating condition. Located Illinois. Box 2209-SD.

¾-YARD

AUSTIN MODEL "MA"—Gasoline Dragline—37' Boom—¾ yd. Page "M" drag bucket. Good operating condition. Located western Nebraska. Box 2198-SD.

NORTHWEST MODEL 105 GAS—40' boom dragline and clamshell, including Page "C" drag bucket. Climax engine. Reasonably good operating condition, Located Atlanta, Ga. Box 995-SD.

⅞-YARD

BUCYRUS-ERIE 1035 Gasoline 40' boom dragline and clamshell, including 1-yd. dragline and clamshell buckets. 26" cat. treads. Waukesha engine. Recently overhauled. Located Colorado. Box 2177-SD.

1-YARD

BUCYRUS-ERIE 30-B Diesel 40' boom dragline. Atlas Diesel 2-cylinder 8½"x10½" engine. $1,500 repairs recently applied. Excellent condition. Located near Chicago. Box 2132-SD.

BUCYRUS-ERIE 32-B Gas 50' boom dragline and 1-yd. "U" Drag bucket. Electric starter. Wisconsin engine. Good operating condition. Located Eastern Pennsylvania. Box 2088-SD.

BUCYRUS-ERIE D-2 — DIESEL DRAGLINE. Atlas engine. Located Texas. 40' Boom, 1¼ yd. Page Bucket. Field reconditioned. Excellent mechanical and operating condition. Box 1020-SD.

LORAIN—Model 55. 40' Boom Gas Dragline and ¾ yd. Williams drag bucket. Operating condition. Located North Carolina. Box 2242-SD.

NORTHWEST—Model 105. 1 yard Shovel and 40' Boom Clamshell and Dragline including 1 yd. Williams clamshell bucket. Field reconditioned summer 1938. Good operating condition. Located Wisconsin. Box 2245-SD.

1¼-YARD

BUCYRUS-ERIE GA-2, Gas-Air 45' boom dragline. Electric starter. Battery lighting system. Waukesha 4-cyinder 6¼"x8" engine. Operating condition. Located Minneapolis, Minn. Box 2210-SD.

BUCYRUS-ERIE E-2 Diesel 45' boom dragline and 1¼-yard Page bucket. Fair working condition. Located Kansas. Box 2173-SD.

BUCYRUS-ERIE E-2 dragline and shovel. 45' boom plus 10' extension. 1¼-yard Page drag bucket. 1½-yard plate dipper. Electric light plant. Atlas Diesel engine. Engine overhauled since last used. Balance of machine good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SD.

LIMA MODEL 101, 1¼-yd. gas 50' boom dragline and shovel. Excellent condition. Located Texas. Box 2029-SD.

P & H—MODEL 210—55' boom dragline including 1¼-yard Page bucket. Gas powered. Located South Dakota. Box 1172-SD.

1½-YARD

KOEHRING—Model 601. 55' boom dragline and clamshell and 1½-yard shovel. Operating condition. Located Wisconsin. Box 2244-SD.

LINK-BELT K-44 Dragline. 44' Boom plus 8' Extension—53'. 1½-yd. Omaha bucket. Waukesha 4-cylinder 6¾"x8" engine. Located Northwestern Missouri. Box 2230-SD.

NORTHWEST MODEL 6 dragline. Boom 50' plus 10' extension. 1¾-yard Page R. C. dragbucket. Kohler light plant. Murphy Diesel engine. Approximately 1 year old. Excellent condition. Located Illinois. Box 2208-SD.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

SMALL CLAMSHELLS AND CRANES
Under 2 Yards

⅜-YARD

BAY CITY—⅜-YARD GAS CLAMSHELL. Also drag shovel equipment. Located near Boston. Box 1084-SCC

½-YARD

BUCYRUS-ERIE 16-B Gas clamshell, dragline and shovel. 35' clamshell—dragline boom. Winch head. ¾-Yd. shovel dipper. Electric starter. Waukesha 6-cylinder 4"x4¾" engine. Very good condition. Located North Carolina. Box 2226-SCC.

P&H MODEL 300—Gas ½-yd. Clamshell. 35' Boom. Also Trench Hoe Equipment. Located near Chicago. Box 2223-SCC.

P & H MODEL 204. 35' boom gasoline clamshell. ⅝-yard Kiesler clamshell bucket. Waukesha engine. New cab. Generally very good condition. Located Chicago. Box 2036-SCC.

¾-YARD

BUCYRUS-ERIE—TYPE B, ¾-yard, 40' boom steam clamshell and shovel. Cat. mounted. Located Buffalo, New York. Box 2005-SCC.

NORTHWEST MODEL 105 GAS — 40' boom clamshell and dragline, including Page "C" drag bucket. Climax engine. Completely reconditioned. Located Atlanta, Ga. Box 905-SCC.

P&H MODEL 400—Combination gasoline crane and ¾-yard shovel. Crane boom 35' plus 10' extension. Waukesha 4-cylinder 5"x6¼" engine. Located vicinity Boston. Box 2203-SCC

⅞-YARD

BUCYRUS-ERIE 1035 Gasoline 40' boom clamshell and dragline including 1-yd. clamshell and dragline buckets. 26" cat. treads. Waukesha engine. Recently overhauled. Located Colorado. Box 2177-SCC

1-YARD

BUCYRUS-ERIE — GA-2 — GAS-AIR 45' Boom Clamshell Machine. Good Operating Condition. Located St. Paul, Minn. Box 1024-SCC.

BUCYRUS-ERIE — GA-2 GAS AIR Clamshell. 45' boom. Single Shaft Caterpillar. Waukesha 4 cylinder 6¼"x8" engine. Rebuilt since original manufacture. Good operating condition. Located New Jersey. Box 1104-SCC.

NORTHWEST—Model 105. 40' boom dragline and clamshell, including 1-yard Williams clamshell bucket. Also 1-yard shovel equipment. Field reconditioned summer 1938. Good operating condition. Located Wisconsin. Box 2245-SCC.

NORTHWEST MODEL 105—45' boom gas crane. Good operating condition. Located vicinity Duluth, Minnesota. Box 2204-SCC.

P&H MODEL 600, 1-yd. gasoline shovel. Crane equipment also available. Waukesha engine. Good condition. Located Connecticut. Box 2113-SCC.

1¼-YARD

BUCYRUS-ERIE GA-3 — Gas-Air 1¼-yd. 45' boom clamshell and high lift shovel. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SCC.

LINK-BELT, MODEL K-2. Gas crane. 50' boom. Also 2 extra 20' inserts to make 90'. Weight 67,000 lbs. Located St. Paul, Minn. Box 2013-SCC.

1½-YARD

KOEHRING—Model 601. 55' boom clamshell and dragline, and 1½-yard shovel. Operating condition. Located Wisconsin. Box 2244-SCC.

LARGE SHOVELS AND DRAGLINES
2 Yards and Over

BUCYRUS-ERIE 50-B, 2-yd. steam shovel. Good operating condition. Located Central New York State. Box 2020-LSD.

BUCYRUS-ERIE 50-B Diesel Dragline Kohler Light Plant. Used only 4 years. Good condition. Located Illinois. Box 2088-LSD.

BUCYRUS-ERIE — 52-B — DIESEL 2½ yard Shovel and Dragline. Atlas engine. Good condition. Located Eastern Pa. Box 1039-LSD.

BUCYRUS-ERIE 55-B—Extra High Lift Diesel Shovel. 35-ft. boom, 22-ft. dipper handle, 2 cu. yd. Bowl Door dipper. Caterpillar mounted. Kohler light plant. Atlas Diesel engine. Used about three months. Just like new. Located Eastern Pennsylvania. Box 1069-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory. Box 2164-LSD.

BUCYRUS-ERIE—CLASS 24 DIESEL dragline. 130-ft. boom, 4 cu. yd. bucket. Truck mounted. 165 h.p. Anderson Diesel engine. Friction drive. Said to be in good operating condition. Located on Mississippi River near New Orleans convenient for loading on barge. Box 1074-LSD.

ANY FAIR OFFER ACCEPTED

BUCYRUS-ERIE—Class 24 steam dragline. 100 foot boom, 5 cubic yard bucket. Skid and roller mounted. Rebuilt 1927 at a cost of $15,000. New locomotive boiler installed 1928. Will accept any fair offer. Located near Fort Worth, Texas. Box 2149-LSD.

If You Do Not Find What You Want Listed—Write Us

EXCAVATING engineer
South Milwaukee, Wis.

BUCYRUS-ERIE 95-C. 3-yard steam shovel. Cats. installed 1925. Fair condition. Located Kansas. Box 2050-LSD.

BUCYRUS-ERIE — 100-B — STEAM SHOVEL. 3 yard Dipper. Machinery very good condition. Located Montreal, Canada. Box 1041-LSD.

BUCYRUS-ERIE 100-C. 3-yard steam shovel. Cat. mounted. Fair condition. Located Kansas. Box 2049-LSD.

BUCYRUS-ERIE 175-B 2 Motor AC Electric Dragline. Truck Mounted. 125' boom. 1 each 4-, 5-, and 6-yd. drag buckets. Chain drive from main motor to intermediate shaft. Extra rotors for main and swing motors and other spare parts. 3—75 KVA 60 cycle 2200/220/440 volt transformer mounted on machine. Power supply 3 phase 60 cycle 440 volt. Completely overhauled since received from factory. First class operating condition. Located Kansas. Box 2082-LSD.

BUCYRUS-ERIE—Class 230 Steam Dragline. 175-foot steel and aluminum boom. 6-yard RED ARCH bucket. Ready to work. Located near New Roads, Louisiana. Box 2152-LSD.

BUCYRUS-ERIE—Class 320 Steam Dragline, 144-foot boom. 8-yard bucket. Located on Illinois River. A good buy. Box 2155-LSD.

BUCYRUS-ERIE — TOWER EXCAVATOR. 130' head tower. 50' tail tower. 12-yard bottomless bucket. Electrical equipment 3 phase 60 cycle 4000 volts Ward Leonard. WILL RENT. Located Louisiana. Box 2069-LSD.

COAL MINE SHOVELS

MARION MODEL 250 STEAM SHOVEL (less dipper handles) with 3 cu. yd. dipper. Also Sullivan 9x12x10 air compressor and receiver.

BUCYRUS 27-D STEAM horizontal thrust coal loader 1½ cu. yd. capacity.

BUCYRUS 225-B ELECTRIC SHOVEL, Ward--Leonard control, with Model 320-B electric machinery. 80' boom, 52' handles. 8 cu. yd. dipper.

All in first class serviceable condition. Available for immediate dismantling. Located near Ft. Smith, Arkansas. Box 2194-LSD.

BUCYRUS-MONIGHAN 1½-T Diesel dragline. 60' boom. Located Kansas. Box 2168-LSD

BUCYRUS-MONIGHAN 2-T Diesel Dragline. 70' boom. Located Kansas. Box 2169-LSD

BUCYRUS-MONIGHAN 2-W Diesel dragline. 70' boom. Located Louisiana. Box 2179-LSD

BUCYRUS-MONIGHAN 3-T Diesel dragline. 77' boom. Located Louisiana. Box 2171-LSD

BUCYRUS-MONIGHAN 3-T DIESEL dragline. Located Arkansas. Box 1056-LSD.

BUCYRUS-MONIGHAN Model 3½-T—70' boom dragline. 2½-yard dragbucket. Fairbanks Morse Diesel engine. Located North Dakota. Box 2205-LSD

BUCYRUS-MONIGHAN 4-W Walking dragline, 80' boom 5½ yard Page bucket, 30' boom insert and 4-yard bucket. Located Tennessee. Box 2150-LSD.

BUCYRUS-MONIGHAN 4-W Diesel Dragline. 110' Boom. 4½-yd. Bucket. Reported good working condition. Located Georgia. Box 2232-LSD.

BUCYRUS-MONIGHAN 5-W Diesel Dragline. 90' Boom. Electric swing. Vortex Air Oil Cleaners. Electric fan in operators platform. 5-yd. "Y" drag bucket. Fairbanks Morse 250 HP Type 33-D 5-cylinder 10"x10½" pump scavenging engine. Auxiliary Waukesha gas engine. Good working condition. Located Colorado River Aqueduct near Indio, Cal. Box 2079-LSD.

BUCYRUS-MONIGHAN MODEL 6160 — Diesel Dragline. 160' boom. 6-yard drag bucket. Fairbanks-Morse Diesel engine. $15,000 extras added since machine was recently purchased. Will rent. Located Montana. Box 2068-LSD.

MARION MODEL 60. 2½-yard steam shovel on railroad trucks. Good appearance and condition. Located Kansas. Box 2051-LSD.

MARION — MODEL 70-E — 3½ yard Electric Shovel. Railway truck mounted. Power Equipment, 3 Phase, 60 cycle, 2300 volt. Good condition. Located Ohio. Box 1050-LSD.

MARION—MODEL 350—8 yard Electric Shovel. Power equipment, 3 Phase, 60 cycle, 2300 volt — Ward-Leonard Control. Mounted on railway trucks. Good condition. Located Minnesota. Box 1049-LSD.

PAGE—MODEL 220—2½ yard Diesel Dragline. 85' Boom. Good operating condition. Located Iowa. Now operating. Box 1052-LSD.

P&H MODEL 900, 3½ yard Diesel Shovel, 33-foot boom, 200 h.p. Fairbanks-Morse engine. Mounted on caterpillars. Box 2151-LSD.

LOCOMOTIVES

STANDARD GAUGE LOCOMOTIVES BARGAINS

2—Baldwin 77-ton 19x26
4—Baldwin 51-ton 17x24
1—American 60-ton 20x26

Located in Minnesota.

Box 2147-ME.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

MISCELLANEOUS EQUIPMENT

CRUSHER

FOR SALE: No. 19 Kennedy Gearless Reduction Crusher. Good condition. Ready to go. P. O. Box 594, Warren, Pa.

For Sale, reasonable: All located Cleveland, Ohio.
1—Austin Trencher Model 42-15..$1000 F.O.B.
1—Buckeye Trencher Model 201....$1300 F.O.B.
1—Twin City Engine 75 h.p., 7¾"x9" ..... $ 250 F.O.B.
1—Goose-neck Trench Hoe boom for P&H 600, slightly used....$ 800 F.O.B.
Box 2211-ME

FOR SALE

Front-end equipment of 50-B W. L. Electric Horizontal Crowd 2 cu. yd. Coal-Loader. In good mechanical condition. Located Kansas. Box 2217-ME.

AMSCO—2½-Yard Manganese Steel, heavy-duty, rock type dragline bucket, including all necessary chains and 11 teeth. Located Minnesota. Box 2216-ME

1—20-TON ALL STEEL GUY DERRICK, 80' mast, 75' boom complete with 6 Guy cables approximately 250' long. Includes Dake steam engine driven winch bolted on side of mast complete with load and cables. Also electric motor in addition to Dake engine. Hand swing. Also included one Westinghouse cross-compound steam driven air compressor. Approximate weight 26,000 lbs. Located Wisconsin. Box 2156-ME.

BROWNHOIST 50' boom steam locomotive crane. Standard gauge car wheel mounted. Overhauled 1937. Located vicinity Chicago. Box 2136-ME

AUSTIN MODEL 42-15 DITCHER. Twin City Gas Engine. 4-Cylinder 7¼"x9". Will cut 22" minimum to 42" maximum width to approximately 20' depth. Has seen comparatively little service and few repairs needed. Completely overhauled before last job. Will demonstrate on notice. Located North Carolina. Box 2222-ME.

BROWNHOIST 40' boom steam locomotive crane. Standard gauge car wheel mounting. Fair condition. Located vicinity Chicago. Box 2135-ME

SHEET STEEL PILING. 16 Pieces. Carnegie Type M-112. 16" wide, ⅝" thick—30.6 lb. per foot. Excellent condition. Located Wisconsin. Box 2237-ME.

QUARRY SHOVEL—MOTOR-GENERATOR SET—4 YARD.
ONE GENERAL ELECTRIC MOTOR-GENERATOR SET consisting of 250 HP synchronous motor 2300/4000 Volts, Hoist generator 125 KW, Swing generator 40 KW, Crowd generator 39 KW, and one Exciter motor-generator set driven by 15 HP Induction motor and one Stationary panel for starting synchronous motor. All in good operating condition, ready for immediate service. Located Minnesota. Box 2240-ME.

LOCOMOTIVE CRANES

4—Standard gauge locomotive cranes, three—20-ton, one—10-ton. Offered at bargain prices. Located Minnesota. Box 2146-ME.

DIPPER FOR SALE

1—3-yard Aluminum Dipper complete. Lip, teeth and front castings of Manganese Steel. Pyramid Coal Corp., Pinckneyville, Ill.

FRUEHOFF SEMI-TRAILER with 8' by 40' Deck. (Can be shortened.) Single rear axle with 4 wheels each with 36"x10" solid rubber tires. Air Brakes. 16 ton capacity. Excellent condition. Located New York. Box 1160-ME.

COAL MINE EQUIPMENT

PRICED TO SELL. The following equipment located a short distance from Ft. Smith, Arkansas may be had at bargain prices for immediate delivery.
No. 3 Centrifugal pump with 10 h.p. motor.
4" Centrifugal pump.
8" Centrifugal pump, direct connected with 50 h.p. motor.
3" Centrifugal pump with 7½ h.p. motor.
I-R compressor with motor and receiver mounted on wagon.
3—I-R paving breakers.
Wood tipple to include 36" drag conveyor with 20 h.p. motor and switch on Conveyor, 15 h.p. motor and switch on conveyor,
15 h.p. motor & switches on shaker,
5 h.p. motor & switches on lump boom,
5 h.p. motor & switches on egg boom,
3 h.p. motor & switch on lump boom hoist.
2—10 KVA transformers.
50 tons good No. 60 relaying steel with six No. 8 turn-outs.
For full particulars, write Box 2193-ME.

3 CU. YD. AX BUCYRUS-ERIE DRAG BUCKET with hoists and drag bail chains, Spreader dump sheave, teeth, hoist and drag socket. Practically new condition. Located Eastern Pennsylvania. Box 2243-ME.

DRAG BUCKET

1½-YARD Type "Y" Bucyrus-Erie Drag Bucket. Good condition. Located Kansas. Box 1166-ME.

DRAGLINE EQUIPMENT

72-ft. Dragline Boom and Fairlead (suitable Bucyrus-Erie 75-B)—Hydraulic Equipment—1 Hoist Drum—1 Drag Drum—1 Boom Suspension, Sway Brace and Suspension Cables. Located Eastern Pennsylvania. Box 1060-ME

1—Allis-Chalmers Newhouse 5" Crusher.
1—150' Conveyor, 24" belt, steel frame.
1—40' Conveyor, 24" belt, steel frame.
1—28' Screen, 4' Diameter.
1—No. 2 Auger Sand Washer, 14'.
1—4-yard steel Hopper.
1—4" water pump.
Box 2250-ME.

CAR TRANSPORTER

CAR-TRANSPORTER or stacker with reach of 135' and dumping height of 75'. Equipped with 4-yard aluminum car. Caterpillar-mounted and suitable for use with shovel having per hour output of 250 yards. Electric drive, 3-phase, 60-cycle, 4000-volt current. This car transporter is in excellent condition and priced to sell. Located near Kansas City, Missouri. Box 2010-ME.

BUCYRUS-ERIE — 55-B Front End Shovel Equipment consisting of 27'6" boom, 18' dipper handle and 2½ yd. Dipper. All in perfect condition, having been used not enough to require replacement of racks or pinions. Located Ohio. Box 2241-ME.

BUCYRUS-ERIE—41-B Shovel Equipment. Consisting of 21' boom, 15' dipper handle, and 1¼ yd. dipper. Located New Jersey. Bargain price. Box 2239-ME.

SHOVEL EQUIPMENT—For Bucyrus-Erie 52-B Diesel. Handled only about 4,000 yards material. Equipment located Alabama. Box 1113-ME

FRONT FOR 32 MARION

1⅛ CU. YD. shovel front end—new dipper—for Marion 32 steamer. Priced right. Located near Chicago. Box 2165-ME.

TWO WESTINGHOUSE steam-driven, single stage, locomotive type Air Compressors. 11" air cylinder, 11" steam cylinder, 12" stroke. Includes governor, gauges, etc. Never been used. Bargain price. Located Pennsylvania. Box 2201-ME

ONE METALWELD, 2-cylinder, 7"x6" vertical Air Compressor, 162 cu. ft. capacity—with subframe and extended shaft with half-coupling. Includes water pump, 18"x41" Metalweld air tank, gauges, etc. Located Pennsylvania. Box 2200-ME

KOEHRING DRAG SHOVEL equipment for Model 301 machine. Used very little. Low price. Located Eastern New York State. Box 1181-ME.

USED CONTRACTORS EQUIPMENT

1—Model 100 Lincoln Revolver with 100' boom and 12' Gantry.
2—275 Koehring Mixers with Electric motors.
1—200-ton Blaw-Knox Bin with weighing batchers, cement scale and push button control.
1—Robinson Pneumatic cement unloader with silo.
1—20-ton Whitcomb Gasoline Dinkey, overhauled.
4—18-ton Steam Dinkeys, overhauled.
12—30-yd. Western Lift Door Air Dump cars.
4—30-yd. Koppel Drop Door Air Dump cars.
26—16-yd. K. & J. Lift Door Air Dump cars.
6—20-yd. K. & J. Lift Door Air Dump cars.
5—2-cu. yd. Blaw-Knox Roller gate Concrete Buckets.
7—70-ton 20x36 Baldwin Switchers.
3—Jordan spreaders excellent condition.
Located Mississippi valley. Box 2011-ME.

DRAG SHOVEL EQUIPMENT—For Bucyrus-Erie 1020 shovel. Located Rhode Island. Box 2003-ME

SURPLUS MINE EQUIPMENT BARGAIN PRICES

Write for prices of this equipment. Save money. Located in Minnesota.
5—Boilers, locomotive and horizontal return tube types, 150 H.P.
14—Flat cars, 36" gauge, 18-ton.
1—Carroll crusher, jaw, 44x28.
1—Motor, 135 H.P. squirrel cage, 1150 r.p.m., 220 v., 3 ph., 60 cy., A. C.; compensator.
3—Rotary converters, 300 Kw., HCC-6-300-1200, Forms P, D, & V, 6 and 3 phase.
1—Switchgear for 3-phase rotary converter, complete, semi-automatic.
3—Transformers, 300 Kw., 66,000 V. Primary, reconnected for 22,000 V. Primary.
1—Ainley placer gold machine, complete. 4-bowl with feed hopper for dragline operation. 40-50 tons per hour.
1—Hoist, double drum.
1—Bucket loader.
8—Pumps, steam (1 gas engine driven) from 49 to 3700 g.p.m.
1—Tractor, Twin City No. 12-20.
1—Water softener, 5 ft., complete.
2—Drums mine hoist, dia. 50", width 40", flange 7", capacity 400' one-inch rope.
Box 2145-ME.

BLAST-HOLE DRILLS

14—Sanderson-Cyclone Model 14, non-traction—six Model 14-SR, traction type, electric blast-hole drills. Also six Loomis Clippers—Models 4 and 44, steam traction. All in good condition, available for immediate shipment. Located New York. Priced to sell. Box 2167-ME.

WANTED

WANTED: Sand and Gravel Washing and Screening Plant. General Materials Company, Baden, Pa.

WANT 2 or 2½-yard full revolving Diesel shovel in first-class condition, located in or near Texas. Send full particulars with price and location for inspection. Box 2247-ME.

WANT used Clamshell digging buckets, Williams or Owens. State price, condition and location. Box 2248-ME.

WANTED: Front for OSGOOD Conqueror. 1-cu. yd. shovel front-end. Condition and price must be right. Box 2249-ME.

WANTED

Bin, 65-ton capacity, circular preferred. Clearance under screen of 11 feet required. Give all particulars in first letter. Box 2251-ME